



CALL NO. 100

CONTRACT ID. 141279

TRIGG COUNTY

FED/STATE PROJECT NUMBER NHPP BRO 0801 (101)

DESCRIPTION CADIZ-AURORA ROAD (US 68)

WORK TYPE BRIDGE REPLACEMENT

PRIMARY COMPLETION DATE 9/30/2018

LETTING DATE: December 19,2014

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 AM EASTERN STANDARD TIME December 19,2014. Bids will be publicly announced at 10:00 AM EASTERN STANDARD TIME.

PLANS AVAILABLE FOR THIS PROJECT.

DBE CERTIFICATION REQUIRED - 8%

REQUIRED BID PROPOSAL GUARANTY: Not less than 5% of the total bid.

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PART I
SCOPE OF WORK

ADMINISTRATIVE DISTRICT - 01

CONTRACT ID - 141279
NHPP BRO 0801 (101)
COUNTY - TRIGG
PCN - DE11100681479
NHPP BRO 0801 (101)

CADIZ-AURORA ROAD (US 68) (MP 8.284) CADIZ-AURORA BRIDGE OVER LAKE BARKLEY (MP 8.872), A
DISTANCE OF 0.60 MILES.BRIDGE REPLACEMENT SYP NO. 01-00180.60.
GEOGRAPHIC COORDINATES LATITUDE 36:48:00.00 LONGITUDE 87:58:33.00

COMPLETION DATE(S):

COMPLETED BY 10/31/2017	INTERMEDIATE MILESTONE - BRIDGE OPEN TO TRAFFIC
COMPLETED BY 09/30/2018	APPLIES TO ENTIRE CONTRACT

CONTRACT NOTES

PROPOSAL ADDENDA

All addenda to this proposal must be applied when calculating bid and certified in the bid packet submitted to the Kentucky Department of Highways. Failure to use the correct and most recent addenda may result in the bid being rejected.

BID SUBMITTAL

Bidder must use the Department's Expedite Bidding Program available on the Internet web site of the Department of Highways, Division of Construction Procurement. (www.transportation.ky.gov/construction-procurement)

The Bidder must download the bid file located on the Bid Express website (www.bidx.com) to prepare a bid packet for submission to the Department. The bidder must submit electronically using Bid Express.

JOINT VENTURE BIDDING

Joint venture bidding is permissible. All companies in the joint venture must be prequalified in one of the work types in the Qualifications for Bidders for the project. The bidders must get a vendor ID for the joint venture from the Division of Construction Procurement and register the joint venture as a bidder on the project. Also, the joint venture must obtain a digital ID from Bid Express to submit a bid. A joint bid bond of 5% may be submitted for both companies or each company may submit a separate bond of 5%.

UNDERGROUND FACILITY DAMAGE PROTECTION

The contractor is advised that the Underground Facility Damage Protection Act of 1994, became law January 1, 1995. It is the contractor's responsibility to determine the impact of the act regarding this project, and take all steps necessary to be in compliance with the provision of the act.

SPECIAL NOTE FOR PIPE INSPECTION

Contrary to Section 701.03.08 of the 2012 Standard Specifications for Road and Bridge Construction and Kentucky Method 64-114, certification by the Kentucky Transportation Center for prequalified Contractors to perform laser/video inspection is not required on this contract. It will continue to be a requirement for the Contractor performing any laser/video pipe inspection to be prequalified for this specialized item with the Kentucky Transportation Cabinet-Division of Construction Procurement.

SPECIAL NOTE FOR COMPOSITE OFFSET BLOCKS

Contrary to the Standard Drawings (2012 edition) the Cabinet will allow 6” composite offset blocks in lieu of wooden offset blocks, except as specified on proprietary end treatments and crash cushions. The composite blocks shall be selected from the Cabinet’s List of Approved Materials.

REGISTRATION WITH THE SECRETARY OF STATE BY A FOREIGN ENTITY

Pursuant to KRS 176.085(1)(b), an agency, department, office, or political subdivision of the Commonwealth of Kentucky shall not award a state contract to a person that is a foreign entity required by [KRS 14A.9-010](#) to obtain a certificate of authority to transact business in the Commonwealth (“certificate”) from the Secretary of State under [KRS 14A.9-030](#) unless the person produces the certificate within fourteen (14) days of the bid or proposal opening. If the foreign entity is not required to obtain a certificate as provided in [KRS 14A.9-010](#), the foreign entity should identify the applicable exception. Foreign entity is defined within [KRS 14A.1-070](#).

For all foreign entities required to obtain a certificate of authority to transact business in the Commonwealth, if a copy of the certificate is not received by the contracting agency within the time frame identified above, the foreign entity’s solicitation response shall be deemed non-responsive or the awarded contract shall be cancelled.

Businesses can register with the Secretary of State at <https://secure.kentucky.gov/sos/ftbr/welcome.aspx>.

SPECIAL NOTE FOR PROJECT QUESTIONS DURING ADVERTISEMENT

Questions about projects during the advertisement should be submitted in writing to the Division of Construction Procurement. This may be done by fax (502) 564-7299 or email to kytc.projectquestions@ky.gov. The Department will attempt to answer all submitted questions. The Department reserves the right not to answer if the question is not pertinent or does not aid in clarifying the project intent.

The deadline for posting answers will be 3:00 pm Eastern Daylight Time, the day preceding the Letting. Questions may be submitted until this deadline with the understanding that the later a question is submitted, the less likely an answer will be able to be provided.

The questions and answers will be posted for each Letting under the heading “Questions & Answers” on the Construction Procurement website (www.transportation.ky.gov/contract). The answers provided shall be considered part of

this Special Note and, in case of a discrepancy, will govern over all other bidding documents.

HARDWOOD REMOVAL RESTRICTIONS

The US Department of Agriculture has imposed a quarantine in Kentucky and several surrounding states, to prevent the spread of an invasive insect, the emerald ash borer. Hardwood cut in conjunction with the project may not be removed from the state. Chipping or burning on site is the preferred method of disposal.

INSTRUCTIONS FOR EXCESS MATERIAL SITES AND BORROW SITES

Identification of excess material sites and borrow sites shall be the responsibility of the Contractor. The Contractor shall be responsible for compliance with all applicable state and federal laws and may wish to consult with the US Fish and Wildlife Service to seek protection under Section 10 of the Endangered Species Act for these activities.

ACCESS TO RECORDS

The contractor, as defined in KRS 45A.030 (9) agrees that the contracting agency, the Finance and Administration Cabinet, the Auditor of Public Accounts, and the Legislative Research Commission, or their duly authorized representatives, shall have access to any books, documents, papers, records, or other evidence, which are directly pertinent to this contract for the purpose of financial audit or program review. Records and other prequalification information confidentially disclosed as part of the bid process shall not be deemed as directly pertinent to the contract and shall be exempt from disclosure as provided in KRS 61.878(1)(c). The contractor also recognizes that any books, documents, papers, records, or other evidence, received during a financial audit or program review shall be subject to the Kentucky Open Records Act, KRS 61.870 to 61.884.

In the event of a dispute between the contractor and the contracting agency, Attorney General, or the Auditor of Public Accounts over documents that are eligible for production and review, the Finance and Administration Cabinet shall review the dispute and issue a determination, in accordance with Secretary's Order 11-004. (See attachment)

10/29/12



Steven L. Beshear
Governor

Commonwealth of Kentucky
Finance and Administration Cabinet
OFFICE OF THE SECRETARY
Room 383, Capitol Annex
702 Capital Avenue
Frankfort, KY 40601-3462
(502) 564-4240
Fax (502) 564-6785

Lori H. Flanery
Secretary

SECRETARY'S ORDER 11-004

FINANCE AND ADMINISTRATION CABINET

Vendor Document Disclosure

WHEREAS, in order to promote accountability and transparency in governmental operations, the Finance and Administration Cabinet believes that a mechanism should be created which would provide for review and assistance to an Executive Branch agency if said agency cannot obtain access to documents that it deems necessary to conduct a review of the records of a private vendor that holds a contract to provide goods and/or services to the Commonwealth; and

WHEREAS, in order to promote accountability and transparency in governmental operations, the Finance and Administration Cabinet believes that a mechanism should be created which would provide for review and assistance to an Executive Branch agency if said agency cannot obtain access to documents that it deems necessary during the course of an audit, investigation or any other inquiry by an Executive Branch agency that involves the review of documents; and

WHEREAS, KRS 42.014 and KRS 12.270 authorizes the Secretary of the Finance and Administration Cabinet to establish the internal organization and assignment of functions which are not established by statute relating to the Finance and Administration Cabinet; further, KRS Chapter 45A.050 and 45A.230 authorizes the Secretary of the Finance and Administration Cabinet to procure, manage and control all supplies and services that are procured by the Commonwealth and to intervene in controversies among vendors and state agencies; and

NOW, THEREFORE, pursuant to the authority vested in me by KRS 42.014, KRS 12.270, KRS 45A.050, and 45A.230, I, Lori H. Flanery, Secretary of the Finance and Administration Cabinet, do hereby order and direct the following:

- I. Upon the request of an Executive Branch agency, the Finance and Administration Cabinet ("FAC") shall formally review any dispute arising where the agency has requested documents from a private vendor that holds a state contract and the vendor has refused access to said documents under a claim that said documents are not directly pertinent or relevant to the agency's inquiry upon which the document request was predicated.
- II. Upon the request of an Executive Branch agency, the FAC shall formally review any situation where the agency has requested documents that the agency deems necessary to

conduct audits, investigations or any other formal inquiry where a dispute has arisen as to what documents are necessary to conclude the inquiry.

- III. Upon receipt of a request by a state agency pursuant to Sections I & II, the FAC shall consider the request from the Executive Branch agency and the position of the vendor or party opposing the disclosure of the documents, applying any and all relevant law to the facts and circumstances of the matter in controversy. After FAC's review is complete, FAC shall issue a Determination which sets out FAC's position as to what documents and/or records, if any, should be disclosed to the requesting agency. The Determination shall be issued within 30 days of receipt of the request from the agency. This time period may be extended for good cause.
- IV. If the Determination concludes that documents are being wrongfully withheld by the private vendor or other party opposing the disclosure from the state agency, the private vendor shall immediately comply with the FAC's Determination. Should the private vendor or other party refuse to comply with FAC's Determination, then the FAC, in concert with the requesting agency, shall effectuate any and all options that it possesses to obtain the documents in question, including, but not limited to, jointly initiating an action in the appropriate court for relief.
- V. Any provisions of any prior Order that conflicts with the provisions of this Order shall be deemed null and void.

FEDERAL CONTRACT NOTES

The Kentucky Department of Highways, in accordance with the Regulations of the United States Department of Transportation 23 CFR 635.112 (h), hereby notifies all bidders that failure by a bidder to comply with all applicable sections of the current Kentucky Standard Specifications, including, but not limited to the following, may result in a bid not being considered responsive and thus not eligible to be considered for award:

102.02 Current Capacity Rating 102.10 Delivery of Proposals
102.08 Irregular Proposals 102.14 Disqualification of Bidders
102.09 Proposal Guaranty

CIVIL RIGHTS ACT OF 1964

The Kentucky Department of Highways, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252) and the Regulations of the Federal Department of Transportation (49 C.F.R., Part 21), issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the ground of race, color, or national origin.

NOTICE TO ALL BIDDERS

To report bid rigging activities call: 1-800-424-9071.

The U.S. Department of Transportation (DOT) operates the above toll-free “hotline” Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the “hotline” to report such activities.

The “hotline” is part of the DOT’s continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

SECOND TIER SUBCONTRACTS

Second Tier subcontracts on federally assisted projects shall be permitted. However, in the case of DBE’s, second tier subcontracts will only be permitted where the other subcontractor is also a DBE. All second tier subcontracts shall have the consent of both the Contractor and the Engineer.

DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

It is the policy of the Kentucky Transportation Cabinet (“the Cabinet”) that Disadvantaged Business Enterprises (“DBE”) shall have the opportunity to participate in the performance of highway construction projects financed in whole or in part by Federal Funds in order to create a level playing field for all businesses who wish to contract with the Cabinet. To that end, the Cabinet will comply with the regulations found in 49 CFR Part 26, and the definitions and requirements contained therein shall be adopted as if set out verbatim herein.

The Cabinet, contractors, subcontractors, and sub-recipients shall not discriminate on the basis of race, color, national origin, or sex in the performance of work performed pursuant to Cabinet contracts. The contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of federally assisted highway construction projects. The contractor will include this provision in all its subcontracts and supply agreements pertaining to contracts with the Cabinet.

Failure by the contractor to carry out these requirements is a material breach of its contract with the Cabinet, which may result in the termination of the contract or such other remedy as the Cabinet deems necessary.

DBE GOAL

The Disadvantaged Business Enterprise (DBE) goal established for this contract, as listed on the front page of the proposal, is the percentage of the total value of the contract.

The contractor shall exercise all necessary and reasonable steps to ensure that Disadvantaged Business Enterprises participate in a least the percent of the contract as set forth above as goals for this contract.

OBLIGATION OF CONTRACTORS

Each contractor prequalified to perform work on Cabinet projects shall designate and make known to the Cabinet a liaison officer who is assigned the responsibility of effectively administering and promoting an active program for utilization of DBEs.

If a formal goal has not been designated for the contract, all contractors are encouraged to consider DBEs for subcontract work as well as for the supply of material and services needed to perform this work.

Contractors are encouraged to use the services of banks owned and controlled by minorities and women.

CERTIFICATION OF CONTRACT GOAL

Contractors shall include the following certification in bids for projects for which a DBE goal has been established. BIDS SUBMITTED WHICH DO NOT INCLUDE CERTIFICATION OF DBE PARTICIPATION WILL NOT BE ACCEPTED. These bids will not be considered for award by the Cabinet and they will be returned to the bidder.

“The bidder certifies that it has secured participation by Disadvantaged Business Enterprises (“DBE”) in the amount of ____ percent of the total value of this contract and that the DBE participation is in compliance with the requirements of 49 CFR 26 and the policies of the Kentucky Transportation Cabinet pertaining to the DBE Program.”

The certification statement is located in the electronic bid file. All contractors must certify their DBE participation on that page. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted.

DBE PARTICIPATION PLAN

Lowest responsive bidders must submit the *DBE Plan/ Subcontractor Request*, form TC 63-35 DBE, within 10 days of the letting. This is necessary before the Awards Committee will review and make a recommendation. **The project will not be considered for award prior to submission and approval of the apparent low bidder’s DBE Plan/Subcontractor Request.**

The DBE Participation Plan shall include the following:

- 1 Name and address of DBE Subcontractor(s) and/or supplier(s) intended to be used in the proposed project;
- 2 Description of the work each is to perform including the work item , unit, quantity, unit price and total amount of the work to be performed by the individual DBE. The Project Code Number (PCN), Category Number, and the Project Line Number can be found in the “material listing” on the Construction Procurement website under the specific letting;
- 3 The dollar value of each proposed DBE subcontract and the percentage of total project contract value this represents. DBE participation may be counted as follows; a) If DBE suppliers and manufactures assume actual and contractual responsibility, the dollar value of materials to be furnished will be counted toward the goal as follows:
 - The entire expenditure paid to a DBE manufacturer;
 - 60 percent of expenditures to DBE suppliers that are not manufacturers provided the supplier is a regular dealer in the product involved. A regular dealer must be engaged in, as its principal business and in its own name, the sale of products to

- the public, maintain an inventory and own and operate distribution equipment;
and
- The amount of fees or commissions charged by the DBE firms for a bona fide service, such as professional, technical, consultant, or managerial services and assistance in the procurement of essential personnel, facilities, equipment, materials, supplies, delivery of materials and supplies or for furnishing bonds, or insurance, providing such fees or commissions are determined to be reasonable and customary.
- b) The dollar value of services provided by DBEs such as quality control testing, equipment repair and maintenance, engineering, staking, etc.;
- c) The dollar value of joint ventures. DBE credit for joint ventures will be limited to the dollar amount of the work actually performed by the DBE in the joint venture;
- 4 Written and signed documentation of the bidder's commitment to use a DBE contractor whose participation is being utilized to meet the DBE goal; and
- 5 Written and signed confirmation from the DBE that it is participating in the contract as provided in the prime contractor's commitment.

UPON AWARD AND BEFORE A WORK ORDER WILL BE ISSUED

Contractors must submit the signed subcontract between the contractor and the DBE contractor, the DBE's certificate of insurance, and an affidavit for bidders, offerors, and contractors from the DBE to the Division of Construction Procurement. The affidavit can be found on the Construction Procurement website. If the DBE is a supplier of materials for the project, a signed purchase order and an affidavit for bidders, offerors, and contractors must be submitted to the Division of Construction Procurement.

Changes to DBE Participation Plans must be approved by the Cabinet. The Cabinet may consider extenuating circumstances including, but not limited to, changes in the nature or scope of the project, the inability or unwillingness of a DBE to perform the work in accordance with the bid, and/or other circumstances beyond the control of the prime contractor.

CONSIDERATION OF GOOD FAITH EFFORTS REQUESTS

If the DBE participation submitted in the bid by the apparent lowest responsive bidder does not meet or exceed the DBE contract goal, the apparent lowest responsive bidder must submit a Good Faith Effort Package to satisfy the Cabinet that sufficient good faith efforts were made to meet the contract goals prior to submission of the bid. Efforts to increase the goal after bid submission will not be considered in justifying the good faith effort, unless the contractor can show that the proposed DBE was solicited prior to the letting date. DBEs utilized in achieving the DBE goal must be certified and prequalified for the work items at the time the bid is submitted. One complete set and nine (9) copies of this information must be received in the

office of the Division of Contract Procurement no later than 12:00 noon of the tenth calendar day after receipt of notification that they are the apparent low bidder.

Where the information submitted includes repetitious solicitation letters it will be acceptable to submit a sample representative letter along with a distribution list of the firms solicited. Documentation of DBE quotations shall be a part of the good faith effort submittal as necessary to demonstrate compliance with the factors listed below which the Cabinet considers in judging good faith efforts. This documentation may include written subcontractors' quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

The Good Faith Effort Package shall include, but may not be limited to information showing evidence of the following:

- 1 Whether the bidder attended any pre-bid meetings that were scheduled by the Cabinet to inform DBEs of subcontracting opportunities;
- 2 Whether the bidder provided solicitations through all reasonable and available means;
- 3 Whether the bidder provided written notice to all DBEs listed in the DBE directory at the time of the letting who are prequalified in the areas of work that the bidder will be subcontracting;
- 4 Whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainty whether they were interested. If a reasonable amount of DBEs within the targeted districts do not provide an intent to quote or no DBEs are prequalified in the subcontracted areas, the bidder must notify the DBE Liaison in the Office of Minority Affairs to give notification of the bidder's inability to get DBE quotes;
- 5 Whether the bidder selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the prime contractor might otherwise perform these work items with its own forces;
- 6 Whether the bidder provided interested DBEs with adequate and timely information about the plans, specifications, and requirements of the contract;
- 7 Whether the bidder negotiated in good faith with interested DBEs not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached;
- 8 Whether quotations were received from interested DBE firms but were rejected as unacceptable without sound reasons why the quotations were considered unacceptable. The fact that the DBE firm's quotation for the work is not the lowest quotation received will not in itself be considered as a sound reason for rejecting the quotation as unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a DBE quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy DBE goals;
- 9 Whether the bidder specifically negotiated with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be subcontracted includes potential DBE participation;
- 10 Whether the bidder made any efforts and/or offered assistance to interested DBEs in obtaining the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the

work requirements of the bid proposal; and

11 Any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include DBE participation.

FAILURE TO MEET GOOD FAITH REQUIREMENT

Where the apparent lowest responsive bidder fails to submit sufficient participation by DBE firms to meet the contract goal and upon a determination by the Good Faith Committee based upon the information submitted that the apparent lowest responsive bidder failed to make sufficient reasonable efforts to meet the contract goal, the bidder will be offered the opportunity to meet in person for administrative reconsideration. The bidder will be notified of the Committee's decision within 24 hours of its decision. The bidder will have 24 hours to request reconsideration of the Committee's decision. The reconsideration meeting will be held within two days of the receipt of a request by the bidder for reconsideration.

The request for reconsideration will be heard by the Office of the Secretary. The bidder will have the opportunity to present written documentation or argument concerning the issue of whether it met the goal or made an adequate good faith effort. The bidder will receive a written decision on the reconsideration explaining the basis for the finding that the bidder did or did not meet the goal or made adequate Good Faith efforts to do so.

The result of the reconsideration process is not administratively appealable to the Cabinet or to the United States Department of Transportation.

The Cabinet reserves the right to award the contract to the next lowest responsive bidder or to rebid the contract in the event that the contract is not awarded to the low bidder as the result of a failure to meet the good faith requirement.

SANCTIONS FOR FAILURE TO MEET DBE REQUIREMENTS OF THE PROJECT

Failure by the prime contractor to fulfill the DBE requirements of a project under contract or to demonstrate good faith efforts to meet the goal constitutes a breach of contract. When this occurs, the Cabinet will hold the prime contractor accountable, as would be the case with all other contract provisions. Therefore, the contractor's failure to carry out the DBE contract requirements shall constitute a breach of contract and as such the Cabinet reserves the right to exercise all administrative remedies at its disposal including, but not limited to the following:

- Disallow credit toward the DBE goal;
- Withholding progress payments;
- Withholding payment to the prime in an amount equal to the unmet portion of the contract goal; and/or
- Termination of the contract.

PROMPT PAYMENT

The prime contractor will be required to pay the DBE within seven (7) working days after he or she has received payment from the Kentucky Transportation Cabinet for work performed or materials furnished.

CONTRACTOR REPORTING

All contractors must keep detailed records and provide reports to the Cabinet on their progress in meeting the DBE requirement on any highway contract. These records may include, but shall not be limited to payroll, lease agreements, cancelled payroll checks, executed subcontracting agreements, etc. Prime contractors will be required to submit certified reports on monies paid to each DBE subcontractor or supplier utilized to meet a DBE goal. These reports must be submitted within 14 days of payment made to the DBE contractor.

Payment information that needs to be reported includes date the payment is sent to the DBE, check number, Contract ID, amount of payment and the check date. Before Final Payment is made on this contract, the Prime Contractor will certify that all payments were made to the DBE subcontractor and/or DBE suppliers.

The Prime Contractor should supply the payment information at the time the DBE is compensated for their work. Form to use is located at:

<http://transportation.ky.gov/Construction/Pages/Subcontracts.aspx>

The prime contractor should notify the KYTC Office of Civil Rights and Small Business Development seven (7) days prior to DBE contractors commencing work on the project. The contact is Melvin Bynes and the telephone number is (502) 564-3601.

Photocopied payments and completed form to be submitted to: Office of Civil Rights and Small Business Development 6th Floor West 200 Mero Street Frankfort, KY 40622

DEFAULT OR DECERTIFICATION OF THE DBE

If the DBE subcontractor or supplier is decertified or defaults in the performance of its work, and the overall goal cannot be credited for the uncompleted work, the prime contractor may utilize a substitute DBE or elect to fulfill the DBE goal with another DBE on a different work item. If after exerting good faith effort in accordance with the Cabinet's Good Faith Effort policies and procedures, the prime contractor is unable to replace the DBE, then the unmet portion of the goal may be waived at the discretion of the Cabinet.

06/20/2014

TRAINEES

In Compliance with the "TRAINING SPECIAL PROVISION" included in Part III of the Proposal, the Contractor will be required to employ a trainee(s) for this contract.

ASPHALT MIXTURE

Unless otherwise noted, the Department estimates the rate of application for all asphalt mixtures to be 110 lbs/sy per inch of depth.

DGA BASE

Unless otherwise noted, the Department estimates the rate of application for DGA Base to be 115 lbs/sy per inch of depth.

DGA BASE FOR SHOULDERS

Unless otherwise noted, the Department estimates the rate of application for DGA Base for Shoulders to be 115 lbs/sy per inch of depth. The Department will not measure necessary grading and/or shaping of existing shoulders prior to placing of DGA Base, but shall be incidental to the Contract unit price per ton for DGA Base.

Accept payment at the Contract unit price per ton as full compensation for all labor, materials, equipment, and incidentals for grading and/or shaping of existing shoulders and furnishing, placing, and compacting the DGA Base.

INCIDENTAL SURFACING

The Department has included in the quantities of asphalt mixtures established in the proposal estimated quantities required for resurfacing or surfacing mailbox turnouts, farm field entrances, residential and commercial entrances, curve widening, ramp gores and tapers, and road and street approaches, as applicable. Pave these areas to the limits as shown on Standard Drawing RPM-110-06 or as directed by the Engineer. In the event signal detectors are present in the intersecting streets or roads, pave the crossroads to the right of way limit or back of the signal detector, whichever is the farthest back of the mainline. Surface or resurface these areas as directed by the Engineer. The Department will not measure placing and compacting for separate payment but shall be incidental to the Contract unit price for the asphalt mixtures.

FUEL AND ASPHALT PAY ADJUSTMENT

The Department has included the Contract items Asphalt Adjustment and Fuel Adjustment for possible future payments at an established Contract unit price of \$1.00. The Department will calculate actual adjustment quantities after work is completed. If existing Contract amount is insufficient to pay all items on the contract with the adjustments, the Department will establish additional monies with a change order.

OPTION A

Be advised that the Department will accept compaction of asphalt mixtures furnished for driving lanes and ramps, at 1 inch (25mm) or greater, on this project according to OPTION A in accordance with Section 402 and Section 403 of the current Standard Specifications. The Department will require joint cores as described in Section 402.03.02 for surface mixtures only. The Department will accept compaction of all other asphalt mixtures according to OPTION B.

SPECIAL NOTES FOR LAKE BARKLEY BRIDGE PROJECT

SCHEDULED FOR DECEMBER 19, 2014 LETTING

SPECIAL NOTES (BRIDGE):

FOR DRILLED SHAFTS
FOR NON-DESTRUCTIVE TESTING IN DRILLED SHAFTS
FOR VIBRATION MONITORING
FOR STEEL ERECTION – ARCH SPAN
FOR STEEL ERECTION – APPROACH SPANS
FOR STAINLESS STEEL REINFORCEMENT
FOR BRIDGE STRAND HANGERS
FOR DISK BEARINGS
FOR LCE SEISMIC ISOLATION BEARINGS (TYPES A & B)
FOR VISCOUS DAMPERS
FOR FINGER EXPANSION JOINT
FOR MODULAR EXPANSION JOINT
FOR LIGHTING PROTECTION SYSTEM
FOR DECORATIVE FENCE PANEL
FOR INSTALL – DUCT BANK
FOR SHOP DRAWINGS & WELDING PROCEDURES
(6U) FOR STRUCTURAL MASS CONCRETE
(6J) FOR NON-EPOXY ADHESIVES

SPECIAL PROVISIONS (BRIDGE):

(69) FOR EMBANKMENT AT BRIDGE END BENT STRUCTURES

SPECIAL NOTES (GENERAL):

FOR HELPER BOAT
FOR REMOVAL OF EXISTING BRIDGE
FOR CONSTRUCTION TRAILER
FOR WEB CAMERA CONSTRUCTION MONITORING SYSTEM
FOR CPM SCHEDULING
FOR PROJECT INSPECTION BOAT
FOR CONSTRUCTION ACCESS
FOR ENGINEERING-RELATED CONSULTING SERVICES
FOR INTERMEDIATE MILESTONES
FOR AVIATION CONSTRUCTION PERMITS
FOR MAINTAINING EXISITING BRIDGE

Trigg County Item No. 1-180.60
Lake Barkley Bridge

SPECIAL NOTE FOR DRILLED SHAFTS

Trigg County –US68/KY80 Bridge over Lake Barkley

1.0 General

1.1 Description

This work consists of furnishing all tools, equipment, materials, services, labor and incidentals necessary for constructing drilled shafts in accordance with details shown on the plans. The Kentucky Standard Specifications for Road and Bridge Construction, current edition governs unless otherwise specified in this special note or in the plans. This Special Note completely replaces Special Note 11C, and Special Note 11C does not apply to this project.

For the purposes of this Special Note, “Department” refers to the Kentucky Department of Highways and/or consultants acting on behalf of the Department of Highways. “Engineer” is defined in Section 101.03 of the Standard Specifications.

1.2 Site, Subsurface Information and Samples Inspection

Bidders are cautioned to expect difficult subsurface conditions at this site. Bidders are encouraged to consult available geological literature including but not necessarily limited to the Canton Geologic Quadrangle Map and the U.S. Geological Survey Professional Paper 1151-H, “The Geology of Kentucky -- A Text to Accompany the Geologic Map of Kentucky”, Edited by Robert C. McDowell. Additional geotechnical information may be available via the KYTC Division of Construction Procurement Website under “Project Related Information”. The referenced geological literature and geotechnical information are for information only and are not contract documents. However, available subsurface data are included in the bridge plans which are contract documents.

Medium dense to dense sand and gravel layers and residual chert interbedded within the sand and gravel were encountered during geotechnical explorations. Some of this material was difficult to penetrate using conventional geotechnical rotary drilling equipment with diamond-impregnated casing bits and carbide tricone roller bits. Although sand- and gravel-sized chert particles were sampled, it is possible that chert particles which are larger than gravel-sized will be encountered during the construction. In addition, the limestone bedrock contains chert nodules and inclusions that made coring the limestone bedrock occasionally difficult.

Rock excavation in drilled shafts at other projects within the vicinity of this project have required reverse circulation drilling methods to successfully excavate the

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limestone bedrock that contains various sizes and distribution of chert inclusions. Methods of seating of the permanent steel casing into the limestone bedrock should consider the limestone with chert inclusions encountered at all drilled shaft locations and the potential for vertical crevices and undulating bedrock surface at drilled shaft foundations.

Potential vertical crevices or pinnacled bedrock surfaces were encountered in Borings B5009, B5011, B5013W, B5066 and B5066A. At projects located at the north end of Kentucky Lake, vertical crevices were observed within the rock excavations and in borings associated with the subsurface grouting program. Limestone outcrops with vertical crevices are visible on the east bank of Lake Barkley at/near the End Bent 2 location. Based on the presence of vertical crevices observed in the spillway excavation for the Kentucky Lake Dam and the test boring results, it is anticipated that some vertical crevices will be encountered during construction of the drilled shaft foundations.

During the geotechnical exploration program, a casing advancer was lost in the soil column at Boring B5006, and core barrels were lost in the bedrock at Borings B5014 and B5066 (see Subsurface Data Sheets in the plans) and may be encountered when drilling the foundation shafts at these locations.

In addition, some of the borings drilled at the bridge pier and end bent drilled shaft locations encountered voids in the limestone bedrock due to karst conditions. The voids appear to be filled with either silty sand, sand, gravel, rock fragments or clay. However, some water-filled or air-filled voids could be encountered. In addition, voids in bedrock due to karst or variable top of rock conditions due to karst could be encountered at locations other than those encountered in the subsurface investigation borings. Such variations in voids or top of rock may exist between adjacent boring locations or within the footprint of a drilled shaft. Such variations will not be considered grounds for differing site conditions. Bidders are advised to factor any and all risks associated with the conditions at the site into their bids.

The prospective bidders are strongly encouraged to visit the project site and the drilled shaft contractors are required to inspect available rock cores prior to the letting date. Representatives of the prime contractor and the drilled shaft subcontractor(s) (if applicable) will be required to inspect the rock cores prior to beginning drilled shaft construction. Only the cores obtained in 2014 (B5000 series borings) will be available for inspection. To schedule a viewing of the rock cores, contact the Division of Structural Design, Geotechnical Branch (502-564-2374), a minimum of two business days in advance. The bidders are also responsible to familiarize themselves with the available geotechnical data, which provides further information regarding the anticipated soil and bedrock conditions that will impact the installation of the drilled shafts. Failure to inspect the project

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site and view the available rock cores will result in the forfeiture of the right to file a claim based on site conditions and may result in disqualification from the project.

1.3 Disclaimer

Acceptance of any of the contractor's submissions required by this note does not constitute endorsement or approval. The acceptance is acknowledgement of the work performed and authorization for the contractor to proceed. The Department is not bound by acceptance of any of the submissions required by this note. Final acceptance will be contingent on the satisfactory completion of the work required by this note.

2.0 Submittals

Make submittals via SharePoint software in accordance with the Project requirements for submittals. See Table 1 below. The Department will respond to the Contractor regarding acceptability of submittals within ten (10) business days, unless indicated otherwise in this special note. A "Business Day" is defined as any day except Saturdays, Sundays and Holidays, as defined in Section 101.03 of the Standard Specifications.

Table 1 – Schedule of Drilled Shaft Submittals			
Submittal Number	Submittal Item	Calendar Days	Event
1	Drilled shaft contractor/subcontractor to be used	30 After	Notice to Begin Work
2	Drilled shaft supervisor experience and qualifications	30 After	Notice to Begin Work
3	Subsurface Exploration Plan	30 Before	Start of Subsurface Exploration
4	Drilled Shaft Installation Plan (includes initial cavity remediation plan)	45 Before	Start of Drilled Shaft Construction
5	Concrete trial mix reports	20 Before	Start of Drilled Shaft Construction
6	Drilled shaft preconstruction meeting	10 Before	Start of Drilled Shaft Construction

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Table 1 – Schedule of Drilled Shaft Submittals			
Submittal Number	Submittal Item	Calendar Days	Event
7	Revised Cavity Remediation Plan(s)	20 After	Completion of Subsurface Exploration and/or installation of technique drilled shafts and/or installation of production shafts requiring remediation
Provide all submittals and reports in .pdf format			

2.1 Contractor Pre-Qualification

The drilled shaft contractor for Piers 1-13 is required to be pre-qualified by the Department for “Marine Drilled Shafts” prior to beginning drilled shaft construction. Prime contractors or subcontractors who intend to perform drilled shaft construction are strongly encouraged to become pre-qualified prior to bidding. The drilled shaft contractor for End Bent 2 is required to be pre-qualified by the Department for “Drilled Shafts” prior to beginning drilled shaft construction. These pre-qualification requirements apply to both a prime contractor who self-performs drilled shaft construction and subcontractor(s) who perform drilled shaft construction. This prequalification is optional for placing reinforcing steel and concrete for the drilled shafts. However, the applicable Drilled Shaft pre-qualification is required in order to perform other drilled shaft operations such as drilling, casing installation, karst remediation, etc. If the prequalified drilled shaft contractor does not place concrete or grout for cavity stabilization then the drilled shaft supervisor is required to be present to oversee those operations.

2.2 Drilled Shaft Construction Personnel Experience

2.2.1 Drilled Shaft Supervisor(s)

Provide documentation that current company personnel who will be directly responsible for field operations at Piers 1-13 meet the requirements below:

1. A minimum of 10 years experience in drilled shaft and/or heavy marine construction including at least five (5) years of supervisory experience.

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2. At least two (2) projects in the last 10 years installing drilled shafts in water 20 ft. or deeper with total drilled shaft lengths of 40 ft. or deeper in a marine environment using heavy marine equipment.
3. At least two (2) projects in the last 10 years constructing rock socket drilled shafts with rock socket diameters 5 feet or larger and at least 10 feet in length. At least one (1) of these must be a marine environment using heavy marine equipment.
4. At least one (1) project in the last 10 years constructing rock socket drilled shafts in hard bedrock with Karst type features.
5. At least one (1) project in the last 10 years constructing rock socket drilled shafts in hard bedrock where cavities/voids were encountered that required remediation and/or stabilization (e.g. sealing with steel casing, or pumping concrete and re-drilling or a combination of steel casing and pumping concrete).

NOTE: Item 5 is in addition to the personnel requirements for Marine Drilled Shaft pre-qualification. The Contractor will be required to assign personnel meeting the requirements of Items 1-4 specifically to this project and may need to hire additional personnel after meeting pre-qualification requirements. The personnel in Item 5 do not have to be assigned full-time to this project and may be consultants; however, they need to be familiar with and have visited the project.

Some or all of the experience may be with a previous employer. If necessary, more than one drilled shaft superintendent or foreman can be used to meet the requirements if all are actively involved in the project.

2.2.2 Project Engineer(s)

Provide documentation that current company personnel includes a licensed Professional Engineer(s) with at least five (5) years experience in design of concrete mixes and design of drilled shaft installations. Also provide documentation that the Professional Engineer(s) have experience designing installation plans within drilled shaft rock sockets in bedrock containing cavities due to karst conditions on at least 2 prior drilled shaft projects. The engineer(s) can be employees of the contractor or can be hired consultants. Multiple engineers can be used to satisfy the experience criteria in this section and are not required to be assigned full-time to this project; however, they need to be familiar with and have visited the project.

2.3 Subsurface Exploration Plan

No later than 30 calendar days prior to performing Subsurface Exploration described in Section 4.12 of this Special Note, submit a Subsurface Exploration

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Plan for review by the Department. Include tables showing proposed borings/rock cores in the Subsurface Exploration Plan and anticipated location tolerances for the rock core borings. Include station, offset and coordinates of the proposed borings in the tables. Provide a drawing for each drilled shaft where subsurface borings/rock cores are required showing the proposed and existing borings/rock cores in the Subsurface Exploration Plan. Also include in the plan how the boring locations will be accessed, the drilling methods that will be used, and plans for United States Coast Guard (USCG) notification (if required under the USCG Construction Permit). Final acceptance by the Department will be subject to satisfactory performance in the field.

Submit documentation in the Subsurface Exploration Plan including a resume which addresses the specific experience of the subsurface exploration drill crew supervisor(s) and containing names and current phone numbers of owners' representatives who can verify the supervisor(s) meet the following requirements:

1. Meets personnel requirements for Drill Crew Supervisor as stated in the KYTC prequalification requirements, with a minimum 5 years drilling experience.
2. Minimum 3 projects with rock coring, with a minimum 1 project rock coring in karst bedrock.
3. Minimum 1 project barge drilling on water where casing is extended from the barge deck to the mudline or deeper
4. Minimum 1 project where casing advancer was used to advance the borings in the soil column.
5. Minimum 1 project where drilling mud was used to advance the borings in the soil column.

The Department will notify the contractor within 10 business days of the Subsurface Exploration Plan acceptance status.

2.4 Pre-Construction Submittals

No later than 45 calendar days prior to constructing drilled shafts, submit a Drilled Shaft Installation Plan for review by the Department. Final acceptance of the Drilled Shaft Installation Plan by the Department will be subject to satisfactory performance in the field of the Technique Drilled Shaft construction. Provide a plan containing detailed information regarding this project including the following:

- (a) List and size of proposed equipment including cranes, drills, augers, bailing buckets, final cleaning equipment, desanding equipment, slurry pumps, core sampling equipment, tremies or concrete pumps, casings, etc.
- (b) Details of overall construction operation sequence and the sequence of shaft construction.

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- (c) Details of shaft excavation methods and method that will be used to ensure that rock socket is centered and method to ensure that soil and rock remain stable during shaft excavation.
- (d) Details of casing to be used including calculations showing ability of casing to withstand anticipated hydraulic and earth pressures and to withstand stresses due to installation without undue deformation. Include detailed methods for casing handling, splicing, straightening, and out-of-round correction with any associated timetables.
- (e) Details of slurry (if used). See requirements for Slurry Submittals in Section 3.4 of this Special Note.
- (f) Details of proposed methods to clean shaft and inside of casing after initial excavation.
- (g) Details of reinforcement handling, lifting, and placement including support and method to center in shaft, must include rebar cage support during concrete placement.
- (h) Details of concrete placement including proposed operational procedures for concrete tremie or pump including initial placement (including method(s) to ensure the required minimum 10 feet tremie immersion is achieved), raising during placement, and overfilling of the shaft to expel contaminated concrete.
- (i) Details of temporary casing removal if contractor elects to use temporary casing.
- (j) Required submittals including shop drawings and concrete design mixes.
- (k) Other information shown in the plans or requested by the Engineer.
- (n) Special considerations for wet construction.
- (o) Details of environmental control procedures to protect the environment from discharge of excavation spoil, dry polymer slurry (if used) and concrete overpour.
- (p) Method for measuring and determining vertical and horizontal alignment during construction.
- (q) How excavated material is to be disposed.
- (r) Remediation plans for encountered voids within the excavated bedrock, including: 1. smaller voids (less than 12 inches in maximum dimensions) and 2. more cavernous type voids that would require excessive concrete placement. Include items required in Section 4.6 of this special note.
- (s) Provide a plan to drill Drilled Shafts 6 and 66 where casing advancer was lost in the soil column and core barrel was lost in the bedrock, respectively during geotechnical exploration boring program.
- (t) Proposed method to provide inspectors access to the top of permanent and/or temporary casing to allow inspection of the shafts.
- (u) SID (shaft inspection device) or approved equal inspection of drilled shaft bottom, including name of subcontractor (if applicable) performing this work.
- (v) Provide a plan to install the CSL tubes within the planned reinforcing cages as specified in the Special Note for Non-Destructive Testing.

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- (w) Method of inspection of the sidewalls of the drilled shaft rock sockets at End Bent 2 for horizontal cavities and vertical crevices.

Within 10 business days after receipt of the plan, the Department will notify the contractor of any additional information required and/or changes necessary to meet the contract requirements. Any part of the plan that is unacceptable will be rejected. Resubmit changes agreed upon for reevaluation to the Department. The Department will notify the Contractor within 10 business days after receipt of proposed changes of their acceptance or rejection. All procedural acceptance given by the Department are subject to trial and satisfactory performance in the field by the contractor and do not relieve the contractor of the responsibility to satisfactorily complete the work as detailed in the plans and specifications. Do not start construction on any items affected by the Drilled Shaft Installation Plan until the plan is accepted by the Department. No additional costs or time extensions from Delays due to resubmission of the Drilled Shaft Installation Plan will be accepted by the Department.

2.5 Concrete Trial Batch Reports

At least 20 days prior to starting drilled shaft construction, submit reports of concrete trial batches as specified in Section 3.1.2 of this Special Note. These reports will be subject to review and acceptance by the Department.

2.6 Drilled Shaft Pre-Construction Meeting

A pre-construction meeting to discuss drilled shaft construction will be required. This meeting will be held after all drilled shaft submittals have been received and reviewed by the Department and at least 10 working days prior to the beginning of drilled shaft construction. The purpose of the meeting is to discuss construction procedures, personnel, and equipment to be used. The following are required to attend:

1. Representing the Contractor – Project Superintendent, Drilled Shaft Superintendent or Foreman, and Foreman in charge of the following operations (if different than the Drilled Shaft Superintendent or Foreman): placing casing, excavating shafts, mixing slurry, tying and setting steel reinforcement, and pumping and placing concrete.
2. Representing KYTC – Drilled Shaft Inspector(s), Section Engineer, Central Office Construction Engineer, Geotechnical Branch and others as deemed appropriate by the Section Engineer.

If the Contractor's key personnel change or if the contractor proposes a significant revision to drilled shaft construction procedures, an additional drilled shaft pre-construction meeting may be required at the discretion of the Engineer.

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2.7 Revised Cavity (Karst) Remediation Plan(s)

After completing the subsurface exploration and evaluating the data, revise the cavity remediation plan for karst conditions in the bedrock, if revisions are determined necessary by the Contractor or Engineer. Submit the plan if the Contractor or the Engineer is of the opinion that the conditions encountered in the rock cores warrant modification of the original cavity remediation plan indicated in Item (r) of Section 2.4 of this Special Note. Submit the plan to the Department within 20 calendar days after completing the required subsurface exploration of the drilled shaft locations at Bridge Piers 1 to 6 and/or technique drilled shaft or production drilled shafts requiring remediation (See Section 4.6 for further requirements). The Department will notify the Contractor within 10 business days after receipt of proposed changes of their acceptance or rejection of the revised plan. All procedural acceptance given by the Department is subject to trial and satisfactory performance in the field by the contractor during installation of the second technique drilled shaft and drilled shafts where cavities were encountered in the bedrock and do not relieve the contractor of the responsibility to satisfactorily complete the work as detailed in the plans and specifications.

If the Contactor does not intend to revise the initial remediation plan, submit in writing that in the Contractor's opinion, no revisions are required to the initial remediation plan within 20 calendar days after completing the required subsurface exploration of the drilled shaft locations at Bridge Piers 1 to 6.

3.0 Materials

3.1 Concrete Mixes

3.1.1 Design concrete mixes for the drilled shafts having a minimum compressive strength at 28 days of 5000 psi with an air content of 5% +/- 2%. Maintain the slump of the concrete at the time of placement between 7.5 to 10 inches, the maximum coarse aggregate size is 3/8", and maintain the water/cementitious material ratio not to exceed 0.45. Use water reducing and retarding admixtures as required. Type F high range water reducers used in combination with retarding admixtures or type G high range water reducers fully meeting trial batch requirements are permitted. Class F fly ash is permitted in conformance with Section 601. Design the concrete mix having gradual slump loss. Design the concrete mix to have a slump-time relationship ("slump loss") of the concrete exceeding 6 inches after 4 hours from initial mixing and also exceeding 4 inches at 10 hours after batching or 2 hours after estimated placement time per drilled shaft, whichever is longer. Use of a hydration

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stabilizer that has been approved for experimental use in the Kentucky Product Evaluation List (KyPEL) is permitted for the purpose of controlling slump loss.

- 3.1.2** Perform trial batches prior to beginning drilled shaft construction in order to demonstrate the adequacy of the proposed concrete mix per Standard Section 601 and the modifications in this section. Through trial batches, demonstrate that the mix to be used will meet the requirements for temperature, minimum target slump, slump-time relationship ("slump loss"), air content, water/cementitious material ratio, and compressive strength. Trial batch compressive strength requirements will be in accordance with ACI 318, Section 5.3.2. Develop trial batches using the ingredients, proportions and equipment (including batching, mixing, and delivery) to be used on the project. Produce at least two independent consecutive trial batches of 3 cubic yards each using the same mix proportions and meeting all specification requirements prior to the mix design being accepted by the Department. Department personnel will observe all phases of the trial batching. Submit a report containing the results for slump, air content, water/cement ratio, temperature, and compressive strength and mix proportions for each trial batch to the Engineer for review and acceptance. Failure to demonstrate the adequacy of the concrete mix, methods, or equipment to the Engineer is cause for the Engineer to require appropriate alterations in concrete mix, equipment, and/or method by the Contractor to eliminate unsatisfactory results. Provide any additional trial batches required to demonstrate the adequacy of the concrete mix, method, or equipment at no additional cost to the Department and with no extension of contract time.
- 3.1.3** Provide estimated concrete placement durations for each location. Adjust admixture dosages on a case-by-case basis as placement times and ambient temperature variables change. Perform additional trial batching to ensure dosage adjustments are correct.
- 3.1.4** Cavity stabilization concrete/grout – Provide concrete meeting the requirements of Sections 3.1.1 and 3.1.2 above or grout meeting the applicable requirements for "grout" in Section 601.03.03 B) of the Standard Specifications.

3.2 Permanent Casing

- 3.2.1** Provide permanent structural casing meeting the requirements of ASTM A252 Grade 3 or better unless specified otherwise in the plans. Manufacture the casing using ASTM A-1018, Grade 55, Class 1 steel or accepted equivalent. Furnish two copies of certification from the

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fabricator detailing the designated specification with which the furnished casings comply. Welds made at a permanent manufacturing facility shall be made by either automatic fusion weld or electric resistance weld process. Visually inspect 100% of the inside and outside of all welds per AWS D1.1 Section 6.1. A minimum of 25% of each longitudinal, circumferential or spiral weld shall receive nondestructive testing by either radiographic, radiosopic, real time imaging systems or ultrasonic methods compliant with AWS D1.1.

- 3.2.2** Splice the permanent structural casing in accordance with Section 6.13.3 of the LRFD Bridge Design Specifications and AWS D1.1. Use only joint penetration groove welds for splicing. Produce casing splices that are true and straight. Do not use interior splice plates.
- 3.2.3** Provide permanent casing of ample strength to resist damage and deformation from transportation and handling, installation stresses, and all pressures and forces acting on the casing.
- 3.2.4** Where the minimum thickness of the permanent casing is specified in the Plans, it is specified so as to satisfy in-service structural design requirements only. Increase the casing thickness from the minimum specified thickness, as necessary, to satisfy the construction installation requirements with approval by the Engineer. In addition to "Permissible Variations in Widths and Dimensions" specified in ASTM A252, provide permanent casing meeting the following dimensional tolerance requirements: (1) Straightness: do not allow the straightness to vary more than 0.001 times the length of the pile (1/8 in. in any 10-ft length); (2) Radial offset (misalignment) of plate edges in weld seams: transition weld any offset exceeding 25% wall thickness with a 3 to 1 slope from both sides. Cut and realign any offset exceeding 33% of the wall thickness.
- 3.2.5** Ensure permanent casing that is smooth, clean, watertight, true and straight, and of ample strength to withstand handling, and the pressure of concrete, water and the surrounding earth materials. Provide casing with an inside diameter not less than the specified diameter of the drilled shaft. No extra compensation will be allowed for concrete required to fill an oversized casing or oversized excavation. Ensure casing field splices and fit-up conform to the current edition of AWS D1.1 with no exterior or interior splice plates and produce true and straight casing, as well as the following additional requirements.
- a. Provide full penetration butt welds at all welds.
 - b. Visually inspect the full length of all welds.

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- c. Test 33% of the length of each circumferential field weld by radiographic, ultrasonic or other suitable methods. Conform with all testing, repair and acceptance to the requirements of AWS D1.1. If repairs are required, test all repairs using nondestructive testing on both sides of the repair for a length equal to 10% of the length of the casing outside circumference.
- d. Subject all field welding of casings to the approval of the Engineer.
- e. Space all field welds for permanent casing at a minimum of 60 feet along the length of the casing.
- f. Produce final casing meeting the fit-up requirements of AWS D1.1, Section 5.22.3.1, "Girth Weld Alignment (Tubular)," when the project requires the material be spliced utilizing a girth weld.

3.2.6 At time of concrete placement to the top of the rock socket, protect the shaft concrete from water action during placement and curing of the concrete, which may include extending the permanent steel casing above the water level at the time of concrete placement. Concrete discharge into the lake is not permitted. Provide non-contaminated concrete from the bottom of rock socket elevation to the top of concrete elevation in each drilled shaft without a cold joint. Embed the permanent casing into the rock a sufficient amount to create and maintain a concrete tight seal and prevent collapse or excessive deformation of soil outside the permanent casing. Extend permanent casing or use other accepted methods when needed to remediate voids in bedrock. Cut off the casing at the prescribed elevation and trim to within tolerances prior to acceptance. Provide cutting teeth or cutting shoes capable of adequately embedding and sealing the casing into the limestone bedrock.

3.2.7 When accepted by the Department, installation of casing using rotating or oscillating methods will be permitted. Use this casing method in accordance with the equipment and procedures shown in the approved Drilled Shaft Installation Plan, and comply with all other requirements specified herein. Provide casing equipped with cutting teeth or cutting shoe when using rotator and/or oscillator methods to seal the casing into the bedrock. Provide cutting teeth or cutting shoes capable of adequately embedding and sealing the casing into the limestone bedrock. If used, cutting shoes shall conform to ASTM A148, Grade 90-60.

3.2.8 Submit details concerning the proposed casing design with the Drilled Shaft Installation Plan that are consistent with the minimum casing requirements indicated in the design drawings.

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3.3 Temporary Casing

- 3.3.1** If the contractor elects to use temporary casing for any reason, provide temporary casing with smooth wall structural steel that is of ample strength to resist damage deformation from transportation and handling, installation stresses, and all pressures and forces acting on the casing. Prior to placement in the excavation, provide temporary casing that is watertight and clean. Provide temporary casing capable of being removed without deforming and causing damage to the permanent casing or completed shaft, and without disturbing the surrounding soil. The Department will not allow additional costs and will allow no extension of contract time for the use of temporary casings. Leave no temporary casing in-place without the prior acceptance of the Department. Provide temporary casing of uniform outside diameter not less than the specified diameter of the drilled shaft being installed. The method of temporary casing installation and removal must result in intimate contact between the permanent casing and the soil below the design scour elevation.
- 3.3.2** The annulus between temporary casing and the permanent casing must be completely filled with grout or other material allowed by the Department. Place all grout using a tremie tube inserted to the bottom of the temporary casing. As the temporary casing is withdrawn, maintain a sufficient head (minimum 5 feet) of fluid grout in the annulus between the permanent casing and the temporary casing to ensure intimate contact between the permanent casing, the grout and the adjacent soil. Extract temporary casing at a slow, uniform rate with the pull in the line with the shaft axis.
- 3.3.3** When allowed by the Department, installation of temporary casing using rotating or oscillating methods will be permitted. Use this casing method in accordance with the equipment and procedures shown in the approved Drilled Shaft Installation Plan, and comply with all other requirements specified herein. Provide casing equipped with cutting teeth or cutting shoe when using rotator and/or oscillator methods to seal the casing into the bedrock. Provide cutting teeth or cutting shoes capable of adequately embedding and sealing the casing into the limestone bedrock, if required as part of the Contractor's plan.

- 3.3.4** Remove all temporary casings unless otherwise shown on the plans.

3.4 Slurries

If used, provide a sufficient quantity of slurry mix meeting the material

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requirements. Provide slurry containing material not detrimental to the concrete or surrounding ground strata. Any use of polymer or any other slurry at the contractor's option will be included in the unit bid prices for Drilled Shaft, Common and Drilled Shaft, Rock. Slurry use and requirements in drilled shafts where karst conditions exist may depend on the cavity remediation method. If the Department decides that the slurry construction method is failing to produce the desired final results, discontinue operations and propose an alternate method for approval by and at no additional cost to the Department.

3.4.1 Slurry Submittals

As part of the Drilled Shaft Installation Plan, submit a Proposed Method of Slurry Use (if used), including the following prepared by the Slurry Supplier:

1. a detailed slurry mix design, specific slurry properties, time for hydration, and a discussion of suitability for the anticipated subsurface conditions;
2. methods to mix, circulate, and de-sand the slurry; details of the proposed testing, test methods, sampling methods, and test equipment;
3. the name and current phone number of the supplier's representative for the project; and
4. any other information the slurry supplier deems necessary.

Also, include the following, prepared by the Contractor or Slurry Supplier:

1. Proposed method and location to dispose of slurry without contaminating the lake.

3.4.2 Slurry Supplier Technical Representative

Provide a technical representative of the slurry supplier for the purpose of:

1. training project inspectors and contractor personnel regarding the slurry properties, handling, placement and proper testing procedures;
2. being at the site during premixing prior to introduction of slurry into the first shaft and during the first 8 hours of drilling or until the mix shows consistent behavior, as determined by the Engineer.
3. being available to provide technical assistance and consultation to the Contractor and/or the Department during construction of all shafts.

Allow direct communication between the technical representative and

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the Department at all times.

3.4.3 Polymer Slurry Materials – Dry Polymer and Emulsified Polymer

Provide PHPA Dry Polymer and mix with water without additives to form a slurry mix meeting the material requirements below. Note higher viscosities may be required to maintain excavation stability in loose or gravelly sand deposits.

Property	Allowable Range	Units	Test Apparatus
Marsh Funnel Viscosity	50-80	sec/qt	Marsh Funnel
pH	7-11		pH paper or pH meter
Density	≤ 64	pcf	Density Balance
Sand Content, at introduction	≤ 1	% by volume	API Sand Content Kit
Sand Content, Immediately prior to placing concrete	≤ 1	% by volume	API Sand Content Kit

Provide Emulsified Polymer and mix with water without additives to form a slurry mix meeting the material requirements below. Note higher viscosities may be required to maintain excavation stability in loose or gravelly sand deposits.

Property	Allowable Range	Units	Test Apparatus
Marsh Funnel Viscosity	33-43	sec/qt	Marsh Funnel
pH	8-11		pH paper or pH meter
Density	≤ 64	pcf	Density Balance
Sand Content, at introduction	≤ 1	% by volume	API Sand Content Kit
Sand Content, Immediately prior to placing concrete	≤ 1	% by volume	API Sand Content Kit

3.4.4 Mineral Slurry Materials

The Department will not allow mineral slurry materials on this project.

3.4.5 Water Slurry

Water may be used as slurry when casing is used for the entire length of the drilled hole, provided that the method of drilled shaft installation maintains stability at the bottom of the shaft excavation. Maintain the water as clean as possible during its use as a slurry. Maintain water slurry with the following requirements.

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Property	Allowable Range	Units	Test Apparatus
Density	≤ 66	pcf	Density Balance
Sand Content	≤ 1	% by volume	API Sand Content Kit

3.4.6 Construction and Testing

Provide a set of slurry testing equipment, including a carrying case, which contains all equipment necessary to test the slurry properties in the applicable table(s) above. This testing equipment is for the exclusive use of project inspectors to perform comparison tests and is in addition to test equipment to be used by the Contractor. This testing equipment will become the property of the Department. Provide this testing equipment at no additional cost the Department.

Designate one person to be responsible for mixing and testing slurry.

Prior to beginning excavation in any shaft where slurry is designated in the Drilled Shaft Installation Plan, premix slurry in tanks using an approved water supply. Only use tanks for slurry mixing, the Department will not permit the use of slurry pits. Use water that does not have characteristics detrimental to the slurry, drilled shaft excavation, or concrete. Additives are not allowed unless approved in writing by the Engineer. Use air diaphragm pumps or other similar non-shearing mixing devices to mix the slurry and pump it into the shaft. Allow adequate time (as prescribed by the slurry supplier) for hydration prior to introduction into the shaft. Provide slurry tanks with adequate capacity for slurry mixing, circulation, storage, and treatment. Sample the slurry in the tanks at a rate of 1 sample per 10,000 gallons and perform control tests on the slurry to determine viscosity, pH, density, and sand content of the freshly mixed slurry. At the discretion of the Engineer, sand content tests may be omitted on selected samples. Representatives of the Department may perform comparison tests as necessary. If any portion of slurry is not within the specified ranges, adjust the mix and retest at no additional cost to the Department.

Prior to beginning drilling, pump slurry meeting the material requirements into the shaft, as directed by the Engineer. Pump slurry to the bottom of the shaft through a hose or tremie pipe. Pump until the slurry is at least 4 ft. above the lake water surface level, unless directed otherwise by the Engineer. Perform a set of tests to determine the properties of the slurry mix in the shaft and report the values to the Engineer immediately. (See the definition of a test set below.)

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Perform tests to establish a consistent working pattern taking into account the mixing process and blending of freshly mixed slurry with previously used slurry. Perform a set of tests every 4 hours of slurry use, during drilling. Perform a set of tests immediately prior to and immediately after every drilling shift. Perform at least 1 test set per day after drilling is complete and prior to concreting. Representatives of the Department may perform comparison tests as necessary.

A set of tests is defined as: viscosity, pH, density, and sand content tests performed on samples extracted from the within 3 ft. of the shaft bottom, approximately mid-length of the shaft at the time of testing. At the discretion of the Engineer, sand content tests may be omitted on selected samples. Take samples using a sampling tool marked so that the depth of the slurry sample can be determined.

Report all test results to the Engineer immediately and add additional slurry, meeting the material requirements, and/or remove slurry to adjust the mix in the shaft when the slurry does not meet the requirements above; pump through a hose or tremie pipe

Take all steps necessary to prevent the slurry from caking along the sides of the shaft at no additional cost to the Department. Such methods may include but are not limited to agitation, circulation, re-reaming and or roughening with appropriate new bottom cleaning and slurry testing prior to placing concrete.

Prior to placing concrete in any shaft excavation, ensure that heavily contaminated suspensions which could impair the free flow of concrete have not accumulated in the bottom of the shaft excavation. Settling time after the completion of drilling may be necessary to accomplish this. Perform a set of tests after completing shaft excavation and initial cleanout. At no additional cost to the Department, remove suspended solids until all values of density and sand content are within the specification herein for the respective slurry type. Clean, re-circulate, de-sand or replace the slurry, as needed, in order to maintain the required slurry properties. Reuse of slurry will be permitted provided the slurry is cleaned, re-circulated, de-sanded, etc. to return the slurry to the specified properties.

Furnish written reports of all tests required above, signed by an authorized representative of the Contractor, to the Engineer on completion of each drilled shaft. Include shaft number, sampling and test times and dates, sample depths and elevations, and all test results.

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3.4.7 Disposal

Dispose of all slurry after use. Dispose of slurry off site in areas approved by the Engineer at no additional cost to the Department and with no extension of contract time. Exercise care to ensure that slurry does not spill into the lake.

Take precautions to ensure that slurry within 15 to 20 ft. of the rising concrete head does not contaminate slurry to be mixed for subsequent shaft excavation. If this slurry is pumped into a mixing tank, use a separate tank. If this tank is to be for used for subsequent slurry mixing, clean the tank thoroughly after slurry disposal to ensure that concrete contamination has been removed. Verify that the tank has been sufficiently cleaned by filling it with water and performing a minimum of 3 pH tests. Continue cleaning the tank until the pH is below 9.

4.0 Execution

4.1 Equipment

Perform the excavations required for the shafts through whatever materials are encountered to the dimensions and elevations shown in the plans. Ensure the methods and equipment are suitable for the intended purpose and the materials encountered. Provide equipment capable of constructing shafts to a tip at Elevation 180 ft.

4.2 Construction Method

Construct drilled shafts as indicated in the plans or described in this Special Note. Propose a construction method on the basis of its suitability to the site conditions and submit it in the Drilled Shaft Installation Plan for acceptance by the Department. Provide a plan for installation of permanent casing from the top of the rock socket to a level capable of protecting the drilled shaft concrete from water action during concrete placement and curing, to a level required for the proposed drilling method, or to the casing cut-off elevation, whichever is higher. After shaft has been cast and reached a minimum strength of 2500 psi, remove permanent casing to the elevation indicated on the plans. Wet method construction techniques are anticipated at the bridge pier locations, and dry method techniques are anticipated at the End Bent 2 location.

4.3 Templates

Provide a fixed template, adequate to maintain shaft position and alignment during all excavation and concreting operations. Floating templates (attached to

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a barge) will not be allowed. Design of templates is the responsibility of the Contractor. Keep templates in place as required to maintain the horizontal position of the drilled shafts.

4.4 Technique Drilled Shafts

Install a technique shaft at Station 3181+00, at project centerline to determine if the methods and equipment used by the contractor are sufficient to produce a completed shaft meeting the requirements of the plans and specifications. Install the technique shaft at Station 3181+00 to a tip at Elevation = 249.0 feet. Install the first technique drilled shaft and receive acceptance of the technique shaft from the Department prior to any bridge pier drilled shaft construction.

Install a second technique shaft for demonstration of methods and equipment in an area of known cavities in the bedrock at Station 3160+79 at the project centerline to a tip Elevation = 199.0 feet. Refer to Boring B5014W for information regarding the cavity depth and thickness within the limestone bedrock. The technique shafts will be non-production shafts having a diameter of 7 feet in the soil and a 6.5 feet diameter in the bedrock. Install the second technique drilled shaft and receive acceptance from the Department prior to construction of any drilled shafts at Piers 1 to 6.

The Contractor's ability to satisfactorily execute proposed construction operations and meet required tolerances will be evaluated during construction of the technique shafts. Subject technique shaft(s) to the same non-destructive testing as the production shafts as indicated in the Special Note for Non-Destructive Testing. Revise the methods and equipment as necessary to satisfactorily construct the drilled shaft within tolerances.

While placing the reinforcement cage, demonstrate to the satisfaction of the Engineer that the fabrication and handling methods to be used will result in reinforcing cages placed in the proper position, with the proper clearances, and without permanent bending, squashing, or racking of the reinforcement cage. During placement, bring the top of the cage to an upright position, lower it into the shaft excavation, and support the reinforcing cage for concrete placement.

Failure to demonstrate the adequacy of the concrete placement methods, and/or equipment during construction of the technique shafts is cause for the Engineer to require appropriate alterations in equipment and/or methods by the Contractor to eliminate unsatisfactory results. Provide any additional technique shafts required to demonstrate the adequacy of revised concrete placement methods or equipment at no additional cost to the Department and with no extension of contract time.

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If at any time during or after the construction of the technique shafts the Contractor fails to satisfactorily demonstrate the adequacy of his methods and/or equipment, the Engineer may require that additional technique shafts be constructed at no additional cost to the Department with no extension of contract time. A post-construction meeting may be required after the successful completion of the first technique shaft and prior to the rock excavation of the first production drilled shaft or the second technique shaft, whichever occurs first. Once acceptance has been given to construct production shafts, no changes will be permitted to the methods or equipment that were used to construct the satisfactory technique shaft(s) without written approval of the Engineer.

Cut-off the technique shafts at the existing mudline elevation (+/- 6 inches) upon acceptance of each technique drilled shaft. Complete cutting-off the technique drilled shafts within 15 business days of acceptance of the technique shafts. The cost of cutting-off the technique drilled shafts at the mudline is incidental to the unit bid price.

4.5 Excavations

The plans indicate the expected bottom of rock socket, top of rock socket, and top of shaft/bottom of footing elevations. Drilled shafts may be extended deeper if the Engineer determines that the material encountered while drilling the shaft excavation is unsuitable and/or is not the same as anticipated in the design of the drilled shaft. Drilled shafts may be shortened if the Engineer determines the material encountered is better than that anticipated.

Cleanout will be by cleanout bucket, air lift or other approved method. If determined by sonar caliper testing upon completion of the drilled shaft that material is caked on the permanent casing, clean the inside of the permanent casing using brushes or other accepted methods. Maintain the fluid elevation in the drilled shaft above the adjacent water surface elevation at times during cleanout. The cost of replacing water or slurry removed during cleanout is the responsibility of the contractor.

If the Contractor fails to satisfy the cleanout criteria on a shaft, submit, in writing, a remedial plan to the Engineer. Until the plan is accepted by the Engineer, no additional drilled shaft excavations can be started on the project. No additional compensation or working days will be allowed for any delays for work stoppage associated with non-compliance of the cleanout criteria.

Do not excavate shafts or install casing within 50 feet of a shaft containing concrete less than 24 hours old. Do not excavate a rock socket within 3 shaft diameters of an existing open rock socket until the adjacent rock socket has been cleaned and filled with reinforced concrete at least 24 hours old. Where karst is

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encountered in the bedrock, no more than one rock socket can be open in a single pier location at the same time.

Maintain a construction method log during shaft installation. Include the following information in the log, including but not limited to the description and approximate top and bottom elevation of each soil or rock material, and remarks. Refer to FHWA publication FHWA-NHI-10-016 dated May 2010 for sample forms in Appendix F for information to be recorded.

<https://www.fhwa.dot.gov/engineering/geotech/foundations/nhi10016/nhi10016.pdf>

Provide the Department with the following records:

- (1) Drilled Shaft Excavation Log
- (2) Record of bottom cleanout and reinforcement cage placement.
- (2) Drilled Shaft Concrete Placement Log
- (3) Field and Theoretical Concreting Curves
- (4) Drilling Slurry test data, if used.

The Engineer may request the submittal of other records.

Dispose of excavated materials which are removed from the shaft in accordance with the Standard Specifications and requirements of other regulatory agencies.

In dry shafts, likely only at End Bent 2, do not permit workmen to enter the shaft excavation for any reason unless both a suitable casing has been installed and adequate safety equipment and procedures meeting applicable OSHA requirements have been provided to workmen entering the excavation. Recommended Procedures for the Entry of Drilled Shaft Foundation Excavations, prepared by ADSC: The International Association of Foundation Drilling, provides guideline recommendations for down-hole entry of drilled excavations.

If the Contractor intends to use divers for any reason to inspect wet drilled shafts or decides after the start of drilled shaft installation to use divers inside the drilled shafts, submit a plan meeting applicable OSHA requirements to the Department for review and acceptance.

4.6 Horizontal Cavity and Vertical Crevice Remediation

Horizontal cavities and vertical crevices are anticipated to be encountered in some of the drilled shaft rock sockets. Borings made at or near the proposed bridge pier locations are shown on the Subsurface Data Sheets. Voids are noted on the Subsurface Data Sheet drawings when encountered in the geotechnical

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exploration programs. The borings have revealed the presence of occasional horizontal cavities and pinnacles and valleys at the rock surface.

Submit an initial plan to remediate karst (cavities) conditions based on the available boring and rock core information at the time of bidding, per Section 2.4 of this Special Note. After completing the required subsurface exploration at the drilled shafts in Piers 1 to 6, submit a revised cavity remediation plan based upon the conditions encountered during the Contractor's subsurface exploration program and/or installation of technique drilled shaft with remediation or during installation of production drilled shafts with remediation, per Section 2.7 of this Special Note. The revised cavity remediation plan only needs to be submitted if conditions are encountered in the Contractor's subsurface exploration that warrant revision of the initial cavity remediation plan, such as cavities/voids in areas that were not indicated in the borings available at time of bidding or voids that extend deeper than the elevations encountered in the borings available at time of bidding. Provide written details addressing the possibility of encountering cavities/voids in drilled shaft construction if they were not encountered in any boring performed by the Department or by the Contractor's drilling consultant, including at Piers 7 and 8. Address how the results of Sonar Caliper Testing will be used to make possible adjustments to drilled shaft remediation.

Seal all horizontal cavities encountered within the drilled shafts 12 inches in dimension or less at the perimeter of the drilled shaft socket sufficiently to prevent concrete loss or clay or other cavity-filling material from entering the drilled shaft during shaft construction. A possible method for sealing these horizontal cavities includes filling the cavities with concrete or grout and redrilling the rock sockets (See Sheets DS1 and DS2 in the Appendix to this Special Note for conceptual sketches of this method). Use sonar caliper testing to determine the presence and vertical dimension of any horizontal cavities are present along the perimeter of the rock socket that were not revealed by the test borings (See Special Note for Non-Destructive Testing in Drilled Shafts).

Seal all horizontal cavities encountered within the drilled shafts greater than 12 inches in dimension at the perimeter of the drilled shaft socket sufficiently to prevent concrete loss or clay or other cavity-filling material from entering the drilled shaft during shaft construction. Possible methods for sealing horizontal cavities include: 1.) installing a steel casing from the top of bedrock socket to some depth below the encountered void into competent bedrock to seal off the void and limit loss of concrete in the encountered void (See Sheet DS3 in the Appendix to this Special Note for a conceptual sketch of this method) or 2.) filling the cavities with concrete and redrilling the rock sockets. Include methods to regain circulation of drilling fluids during drilling when voids are encountered, such as possibly pumping concrete/grout to seal the excavation and reestablishing circulation of drilling fluids. These potential methods are for

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information only. Include the method for sealing cavities proposed for use in the Drilled Shaft Installation Plan (Section 2.3, Item (r)). Sealing methods are subject to acceptance by the Department.

For drilled shafts encountering a vertical crevice greater than 6 inches wide below a depth of 5 feet below the top of bedrock as determined by the Contractor and with the acceptance of the Department, the horizontal cavity remediation procedure using casing shown on Sheet DS3 in the Appendix of this Special Note may be implemented. The Contractor may propose alternative remediation procedures for vertical crevice remediation. It is acceptable to propose alternative remediation procedures to provide sufficient lateral resistance. Alternative methods are subject to the acceptance of the Department.

At the End Bent 2 location, where dry construction methods are likely to occur, propose in the Installation Plan per Section 2.3 of this special note a method for detecting the presence of horizontal cavities in the sidewalls of the rock sockets and vertical crevices in the rock sockets. The use of a scratcher/feeler bar or video methods are considered suitable methods by the Department, but alternative methods of rock socket sidewall inspection would need to be accepted by the Department prior to performing the drilled shaft construction at End Bent 2.

4.7 Obstructions

Remove any subsurface obstructions as they are encountered. Such obstructions may include man-made materials such as old concrete foundations or natural materials such as boulders or trees. Employ special procedures and/or tools when the hole cannot be advanced using conventional augers fitted with soil teeth, drilling buckets, and/or underreaming tools. Such special procedures or tools may include but are not limited to rock augers, core barrels, air tools, hand excavation, temporary casing, or increasing the hole diameter. Blasting is not permitted. Removal of exploratory drilling tools at Drilled Shafts 6 and 66, or lost by the Contractor's drilling consultant at any other shaft locations, are incidental to drilled shaft construction. No extra payment will be made for obstruction removal and is incidental to the applicable unit price bid for "Drilled Shafts".

Remove all drilling tools which are lost by the Contractor in the excavation promptly without compensation. All costs due to tool removal are at the sole expense of the contractor including but not limited to costs associated with excavation degradation due to removal operations or the time the hole remains open.

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4.8 Protection of Existing Structures

Take precautions to prevent damage of existing structures and any existing utilities. Such measures include, but are not limited to, monitoring and controlling the vibrations from driving/vibrating/oscillating/rotating casing or excavating the shafts, and selecting construction methods and procedures that prevent excessive caving of the shaft excavations. Refer to Special Note for Vibration Monitoring for information regarding required precondition surveys and threshold vibration values for the existing bridge structure.

4.9 Inspection of Excavations

Provide safe access and equipment for checking the dimensions and alignment of each shaft. Use a safe device with handrails meeting all applicable OSHA requirements and approved by the Engineer to provide access for project inspectors at the top of casing at the center and any plan location in the shaft. Determine the dimensions and alignment of the shaft under the observation and direction of the Engineer. Cooperate with the Department in the use of any inspection device.

Using a Shaft Inspection Device (SID), verify that the shaft bottom has been adequately cleaned. Perform SID inspection once the accepted bottom of drilled shaft excavation has been achieved and the bottom cleaning of the shaft has been performed. Use SID's with a high-resolution camera mounted in a watertight chamber and fitted with a depth gauge(s) to indicate the thickness of the debris on the shaft bottom. Mini-SID devices meeting the specified requirements of this section will be considered for acceptance by the Department. Have a horizontal gage(s) fitted to the SID in the event any fractures or crevices are observed at the base of the shaft excavation. Furnish all equipment necessary to conduct the SID inspection. Provide nitrogen gas or other means to pump the water out of the interior of the chamber such that the bottom of the shaft is visible. Do a minimum of nine (9) drops as follows: north, northwest, northeast, south, southwest, southeast, east, west, and center to measure sediment at the bottom of the shaft. Operate the SID camera and supporting equipment in such a manner as to obtain optimum clarity from the equipment acceptable to the Engineer. Use television cameras and lighting equipment capable of operating in submerged conditions encountered during the inspection. Record the observations for the shaft bottom on a DVD or flash drive in .mov, .avi or other acceptable electronic format specified by the Engineer to become the property of the Department upon completion of the project. Store DVD's or flash drives in proper containers with dust tight closures. Label DVD's or flash drives as to shaft number, project number, job piece, contract number, and contractor name. Furnish DVD's or flash drives to the Engineer upon completion of the SID inspection.

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Estimate sediment thickness at the bottom of the shaft in terms of percent of view with sediment thicknesses greater than $\frac{1}{2}$ inch and percent of view with sediment thickness greater than $1\frac{1}{2}$ inch at each location. If the average percent of view of sediment thickness greater than $\frac{1}{2}$ inch between all nine locations is greater than 50%, or if the sediment thickness at any point is greater than $1\frac{1}{2}$ inch, the SID test will be considered failed. Perform additional bottom cleaning of the failed shaft using air lift methods. After the Contractor has completed final cleaning, repeat the SID test. Use of weighted tapes to measure sediment at the bottom of the shafts will not be accepted by the Department. Report results of bottom inspection to the Engineer. Continue cleaning until the Engineer is satisfied that the shaft bottom is adequately cleaned and the excavation is approved.

During the SID inspection, report any fractures or crevices observed at the bottom of the shaft. Report any fractures or crevices to the Department. The Department will determine if any vertical crevice remediation will be required.

If the bottom profiling performed during Sonar Calipering Testing or bottom inspection methods approved by the Engineer indicates that excessive sediments as defined above are present on the bottom of the rock socket, perform additional cleanout at the direction of the Engineer.

The cost of inspection equipment and time, including SID inspection and inspection of the sidewalls of the rock sockets at End Bent 2, is incidental to the price per foot of shaft. Sonar Calipering, Crosshole Sonic Logging and Thermal Integrity Profiling, are separate pay items for production and technique drilled shafts, as defined in the Special Note for Non-Destructive Testing in Drilled Shafts.

At the End Bent 2 location, where dry construction methods are likely to occur, propose in the Installation Plan per Section 2.3 of this special note a method for confirming the bottom of the shaft has been adequately cleaned. SID inspection will be considered acceptable by the Department, but alternative methods of bottom inspection would need to be accepted by the Department prior to performing the drilled shaft construction at End Bent 2.

4.10 Construction Tolerances

The following construction tolerances apply to drilled shafts:

- a) Provide drilled shafts within 3 inches of plan position in the horizontal plane at the top of the shaft. Provide drilled shafts within 3 inches of plan position in the horizontal plane at the top of the rock socket. Construct the

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- drilled shaft such that the shaft between the top of the rock socket and the top of the shaft is within 1.5% of plumb. All three requirements will be applied simultaneously. Replace any additional steel reinforcement or concrete needed in the footing due to the misalignment of the shafts at no additional cost to the Department.
- b) Provide vertical alignment of the rock sockets that do not vary from the plan alignment by more than 1/4 inch per foot of depth. (At the top of the rock socket, maintain the centerline of the rock socket within 1.5 inches, in the horizontal plane, of the centerline of the drilled shaft above it).
 - c) Extend the vertical reinforcement a minimum value into the footing, as shown on the plans. Extend the spiral reinforcement above the top of permanent casing into the footing as shown in the plans.
 - d) All drilled shaft diameters shown on the plans refer to inside casing dimensions. The contractor may provide a thicker-walled casing than shown in the plans at no additional cost to the Department, but do not increase the inside diameter of the casing shown on the plans. For out-of-round tolerance of steel casings before and after installation, the departure of any point on the periphery of the casing from the true circle, the maximum tolerable departure of any point is 1 inch measured radially.
 - e) Design excavation equipment and methods so that the completed shaft excavation will have a planar bottom. Maintain the cutting edges of excavation equipment normal to the vertical axis of the equipment within a tolerance of $\pm 3/8$ inch per foot of diameter. Maintain the tip elevation of the shaft within 6 inches from final shaft tip elevation unless otherwise specified in the plans.

The Engineer will use the results of Sonar Calipering to evaluate the construction tolerances; refer to the Special Note for Non-Destructive Testing. Drilled shaft excavations and completed shafts not constructed within the required tolerances are unacceptable. Correct all unacceptable shaft excavations and complete shafts to the satisfaction of the Engineer. Furnish materials and work necessary, including engineering analysis and redesign, to complete corrections for out of tolerance drilled shaft excavations without either additional cost to the Department or an extension of the contract time.

The contractor is responsible for proposing, developing, and after acceptance by the Engineer, implementing corrective work when a shaft excavation is completed with unacceptable tolerances. Typical corrective work includes:

- a) Overdrilling the shaft excavation to a larger diameter and/or depth to permit accurate placement of the reinforcing steel cage with the required minimum concrete cover.
- b) Increasing the number and/or size of the steel reinforcement bars.

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- c) Removing the cage and drilling out the green concrete and reforming the hole.

The acceptance of correction procedures is dependent on analysis of the effect of misalignment and improper positioning. Submit redesigned drawings and computations that are signed by a Professional Engineer licensed in Kentucky.

4.11 Reinforcing Steel Cage Fabrication and Placement

Assemble the reinforcing steel cage, consisting of vertical bars, ties, spirals, cage stiffener bars, spacers, centering devices, and other necessary appurtenances, as a prefabricated unit and place the reinforcing cage immediately after the shaft excavation is inspected and accepted, and just prior to concrete placement. Extend the reinforcing cage to the elevation shown in the plans, but not less than 5 ft. above lake level. Provide steel reinforcement meeting the requirements indicated in the drawings.

Provide reinforcing steel 100% double-wire tied and supported so that it will remain within allowable tolerances for position. Use approved mechanical couplers for splicing the vertical reinforcement. Splice no more than 50% of the vertical reinforcing at any horizontal plane. Provide three feet clear between the couplers of adjacent splices. Provide enough steel reinforcement and mechanical couplers in the event the drilled shaft tip elevations are lowered to Elevation 180 feet. Use bands, temporary cross ties, etc. as required to provide a reinforcement cage of sufficient rigidity to prevent racking, permanent deformations, etc. during installation.

Provide concrete centering devices or other acceptable noncorrosive centering devices at sufficient intervals along the length of the reinforcement cage to insure concentric spacing for the entire cage length. Provide, as a minimum, a set of non-corrosive centering devices at intervals not exceeding 10 feet throughout the length of the shaft. As a minimum, provide a set of centering devices within 2 feet of the top and 2 feet of the bottom of the shaft. In addition, provide one set of centering devices 2 feet above and 2 feet below each change in shaft diameter. As a minimum, provide non-corrosive centering devices at sixty degree intervals around the circumference of the shaft to maintain the required reinforcement clearances. Provide the centering devices with adequate dimension to maintain the specified annular clearance between the outside of the reinforcing cage and the side of the excavated hole or casing.

Concrete centering devices and feet will be constructed of concrete equal in quality and durability to the concrete specified for the shaft. Provide acceptable cylindrical feet (bottom supports) to insure that the bottom of the cage is

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maintained a minimum of 3 inches clear above the bottom of the drilled shaft excavation. The feet are not intended to support the weight of the cage.

In the event that the shaft has been excavated below the anticipated tip elevation, extend the reinforcing cage at the bottom with mechanical connectors in conformance with the Standard Specifications, using the specified staggering requirements.

During concrete placement, support the reinforcing cage at or near the top of shaft such that the bottom of the vertical cage reinforcing bars are positioned approximately 3 inches above the bottom of rock socket elevation. Top of cage supports may be removed twenty-four (24) hours after the completion of concrete placement, but not before shaft concrete has reached a compressive strength of 2500 psi.

Check the elevation of the top of the reinforcing cage before and after the concrete is placed. If this reinforcing cage is not maintained within the specified tolerances, correct the reinforcing cage location to the satisfaction of the Engineer. Do not construct additional shafts until the contractor has modified the reinforcing cage support to obtain the required tolerances.

4.12 Concrete Placement

Perform concrete placement in accordance with applicable portions of the Standard Specifications and with the requirements set forth herein. Do not apply the provisions of structural mass concrete requirements to concrete placement of the Drilled Shafts.

Begin concrete placement as soon as practicable after reinforcing steel placement but no later than forty eight (48) hours after completion of the shaft excavation. Maintain continuous concrete placement from the bottom to above the top elevation of the shaft. If the Contractor would like to pour the drilled shaft to an elevation different than indicated on the plans, submit a request and the reason for a different top of concrete elevation in the drilled shaft to the Engineer for review and acceptance. The Contractor is responsible for ensuring that sound concrete is present at the top of the shaft and will be required to remove any unsound concrete at no additional cost to the Department. Carefully remove any remaining concrete and excess casing above plan top of shaft after curing.

Maintain the slump requirements in Section 3.1.1 of this Special Note. Adjust the admixtures, when accepted for use, in the concrete mix for the conditions encountered on the project so that the concrete remains in a workable plastic state throughout the placement. Satisfactorily perform slump loss tests that

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demonstrate that the concrete will maintain the requirements in Section 3.1.1 of this Special Note. Conduct the slump loss tests using concrete and ambient temperatures appropriate for site conditions.

Provide an acceptable backup plan that accounts for potential breakdowns in placement equipment or the batch plants equipment that will permit the operation to continue with a maximum of one hour delay.

Failure to demonstrate the adequacy of the concrete placement methods, and/or equipment during construction of any production shafts is cause for the Engineer to require appropriate alterations in equipment and/or methods by the Contractor to eliminate unsatisfactory results. Provide any additional technique shafts required to demonstrate the adequacy of revised concrete placement methods or equipment at no additional cost to the Department and with no extension of contract time.

Place concrete through a tremie. Provide tremies used to place concrete consisting of a tube of sufficient length, weight, and diameter to discharge concrete at the shaft base elevation. The tremie pipe needs to be located within 3 ft. of the center of the shaft. Tremies containing aluminum parts that will be in contact with the concrete are not acceptable. Provide a tremie with an inside diameter of at least 6 times the maximum size coarse aggregate to be used in the concrete mix but not be less than 10 inches. Provide tremie pipes with inside and outside surfaces that are clean and smooth to permit both flow of concrete and unimpeded withdrawal during concreting. Provide tremies with a wall thickness that is adequate to prevent crimping and without sharp bends that restrict concrete placement.

Construct tremies to deposit concrete so that they are watertight and will readily discharge concrete. Provide tremies with sufficient weight so that it will rest on the shaft bottom before start of concrete placement. Provide a tremie with sufficient length to extend to the bottom of the excavation. Do not begin underwater placement until the tremie is at the shaft base elevation. Valves, bottom plates, or plugs may be used only if concrete discharge can begin within approximately 2 inches above the excavation bottom. Remove plugs from the excavation, or provide plugs consisting of a material accepted by the Engineer that will not cause defects in the completed drilled shaft if not removed. Construct the discharge end of the tremie to permit the free radial flow of concrete during placement operations. Keep the tremie discharge end at or near the bottom of excavation as long as practical during concrete placement. Sustain the tremie discharge end immersed as deep as practical in the concrete but not less than 10 feet at all times. Excessive immersion may cause the rebar cage to rise. Maintain continuous flow of the concrete during placement. Maintain the

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concrete in the tremie at a positive pressure differential at all times to prevent water or slurry intrusion into the shaft concrete.

If at any time during the concrete pour the tremie line orifice is removed from the fluid concrete column and discharges concrete above the rising concrete surface, the entire drilled shaft will be considered defective. In such case, remove the reinforcing cage, concrete, and repour the shaft. Replacement of defective shafts and all associated costs are the responsibility of the contractor at no additional cost to the Department and with no extension of contract time.

Concrete pumps and lines may be used for concrete placement. Five inches is the minimum diameter for all pump lines. Construct all pump lines with watertight joints.

Drilled shafts which are completed but do not meet the concrete placement requirements of this Special Note or contract plans are unacceptable. Correction of all unacceptable completed shafts to the satisfaction of the Engineer is the responsibility of the Contractor. Furnish materials and work necessary, including engineering analyses and redesign, to complete corrections for unacceptable concrete placement without additional cost to the Department or an extension of the contract time. Propose, develop, and implement corrective work, after acceptance by the Engineer. Typical corrective procedures are outlined in Section 4.9 of this Special Note.

4.13 Subsurface Exploration

Exploratory borings with rock coring were performed by the Department prior to letting of the construction contract. Information regarding the exploratory borings and the boring logs are available via the KYTC Division of Construction Procurement Website under "Project Related Information". The referenced geological literature and geotechnical information are for information only and are not contract documents. However, available subsurface data are included in the bridge plans which are contract documents.

Prior to the construction of the drilled shafts and under the observation of the Department, perform subsurface exploration borings with rock core at locations accepted by the Department based on the Subsurface Exploration Plan per Section 2.3 of this Special Note. Select subsurface exploration borings locations based on the following table, location requirements in this section of the Special Note and Sheet DS4 in the Appendix of this Special Note, or as the Engineer directs to determine the characteristics of the material that the shaft extends through and the material directly below the shaft excavation. When directed by the Department, due to unanticipated voids/cavities in the bedrock during drilled shaft installation, complete subsurface exploration borings prior to continuing

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excavation for any remaining drilled shafts in the bridge pier where subsurface exploratory borings have been requested.

Bridge Pier/End Bent Location	Drilled Shaft Number	Station	Offset	Alignment
Pier 1	1	See Sheet DS4 attached to this Special Note		
Pier 1	2	See Sheet DS4 attached to this Special Note		
Pier 1	3	See Sheet DS4 attached to this Special Note		
Pier 2	4	See Sheet DS4 attached to this Special Note		
Pier 2	5	See Sheet DS4 attached to this Special Note		
Pier 2	6	See Sheet DS4 attached to this Special Note		
Pier 3	7	See Sheet DS4 attached to this Special Note		
Pier 3	8	See Sheet DS4 attached to this Special Note		
Pier 3	9	See Sheet DS4 attached to this Special Note		
Pier 4	10	See Sheet DS4 attached to this Special Note		
Pier 4	11	See Sheet DS4 attached to this Special Note		
Pier 4	12	See Sheet DS4 attached to this Special Note		
Pier 5	13	See Sheet DS4 attached to this Special Note		
Pier 5	14	See Sheet DS4 attached to this Special Note		
Pier 5	15	See Sheet DS4 attached to this Special Note		
Pier 6	16	See Sheet DS4 attached to this Special Note		
Pier 6	17	See Sheet DS4 attached to this Special Note		
Pier 6	18	See Sheet DS4 attached to this Special Note		
End Bent 2	54	3186+00	27' Left	US68/80

Unless directed otherwise, extend subsurface exploration borings with rock core a minimum depth of 35 feet below the bottom of the lowest encountered void in the boring being performed (a void is considered to be a cavity in the rock core having a thickness of 3 inches or greater) or to the elevations in the table below, whichever is deeper. Where no voids are encountered, extend the borings with rock core to the elevations in the table below. Refer to the following table for estimated top of bedrock and bottom of rock core elevation at each Bridge Pier Location, actual depths may need to be adjusted based on the encountered lowest void in the rock cores. Do not drill more than 100 feet below the encountered top of bedrock elevation without contacting the Department. Refer to the bottom of lowest encountered void elevations in the existing borings on the Subsurface Data Sheets in the plans and Sheet DS5 in the Appendix to this Special Note to estimate boring depths where cavities in the bedrock were encountered in previously performed borings.

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Substructure Unit	Estimated Top of Bedrock Elevation (ft.)	Highest Allowable Bottom of Rock Core Elevation (ft.)*
Pier 1	269 to 263	215
Pier 2	261	215
Pier 3	244 to 260	190
Pier 4	250 to 259	215
Pier 5	258	170
Pier 6	258	215
End Bent 2	365	336

*May need to core deeper based upon actual conditions encountered in the rock cores.

Perform the borings/rock cores located at each drilled shaft within Bridge Piers 1 to 6 using appropriate access means, such as a barge to access these locations or a trestle structure. Access the land borings at the bridge end bent drilled shaft locations with rotary drill equipment mounted on an appropriate carrier. Develop a plan proposing two rock core boring locations at each specified drilled shaft at Bridge Piers 1 to 6 such that both borings are located within the proposed drilled shaft rock socket perimeter. Include in the plan a boring at the center of Drilled Shaft 54 located at End Bent 2. Submit the plan for acceptance by the Department. Locate borings within a distance of 1 foot in the east/west direction and 1 foot in the north/south direction of the planned location. Maintain final proposed boring/rock core locations a minimum edge-to-edge distance of 1.5 feet from previously performed boring/rock core locations and within the perimeter of the proposed drilled shaft rock socket perimeter. Obtain data for the previously performed boring locations on the Subsurface Data Sheets and Sheet DS5 in the Appendix to this Special Note.

Perform rock soundings through the soil (drilling without sampling), since the drilled shafts extend into the bedrock. Perform rock core drilling according to the Department's Geotechnical Manual. When the Engineer directs, perform additional subsurface exploration borings prior to drilled shaft construction. Measure rock cores and visually identify and describe them on the subsurface log according to the Department's current Geotechnical Manual. Subsurface exploration borings must be performed by contractors/consultants prequalified by the Department's Division of Professional Services for Geotechnical Drilling Services at the time that field work begins. Submit the driller's logs for each rock core boring to the Department within 3 business days of completing each rock core boring. Allow access by the Department during drilling operations to observe and log the collected rock core at the project site.

The Department representative(s) may be on-site during the subsurface exploration process to evaluate the soil and/or rock core samples. The representative(s) will determine the need to extend the borings to depths greater

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than the depths previously specified. Handle, label, identify, and store soil and/or rock samples according to the Department's current Geotechnical Manual and deliver them with the subsurface logs to the geotechnical branch's rock core lab in Frankfort within 3 business days of completing all of the required borings, unless directed otherwise.

The Engineer will inspect the cores and determine the final depth of required excavation (final drilled shaft tip elevation at drilled shaft foundations in Bridge Piers 1 to 6) based on evaluation of the material's suitability. The Engineer will establish the final tip elevations for shaft locations based on the results of the subsurface exploration. Within 15 business days after completion of the subsurface exploration borings, the Engineer will notify the contractor of the final tip elevations for shaft locations. The final drilled shaft tip elevations may require additional modification based on any revised cavity remediation plans submitted by the Contractor per Section 2.7 of this Special Note.

5.0 Method of Measurement

5.01 Drilled Shaft, Common and Drilled Shaft, Rock

The drilled shafts will be measured for payment to the nearest 0.1 foot of shaft in place. Drilled shaft top of rock elevation is shown in the plans. For pay purposes, the length of any drilled shaft installed above the Drilled Shaft Top of Rock Elevation (Design) as defined in the plans and measured in the field will be measured and paid for at the unit price bid for 'Drilled Shaft, Common'. Drilled shaft installed below the Drilled Shaft Top of Rock Elevation (Design) shown in the plans will be measured and paid for at the unit price bid for 'Drilled Shaft, Rock'.

5.02 Technique Drilled Shafts

The designated technique drilled shaft(s) will be measured for payment at the unit price of each. Technique Shaft unit bid price will refer to the technique shaft at Station 3181+00. Technique Shaft with Remediation unit bid price will refer to the technique shaft at Station 3160+79. Additional technique shafts required due to the Contractor's failure to demonstrate the construction methods will result in an acceptable drilled shaft will be at no cost to the Department.

5.03 Slurry and Temporary Casing

The use of "Polymer Slurry" or "Temporary Casing" will be incidental to the drilled shaft installation. There will be no payment for water used as a drilling slurry. The permanent steel casing indicated in the plans is incidental to the Drilled Shaft-Common unit price. Grouting between any temporary steel casing and

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permanent steel casing is incidental to the unit price bid for 'Drilled Shaft Common'.

5.04 Remediated Drilled Shaft – Common and Rock

Horizontal cavity remediation for karst or remediation of encountered vertical crevice remediation using permanent steel casing or other methods to seal off the cavities ('Remediated Drilled Shaft-Common') will be measured for payment to the nearest 0.1 foot from the top of shaft elevation in the plans to the top of bedrock for all diameters of drilled shafts for the piers shown on the plans. Horizontal cavity remediation for karst or remediation of encountered vertical crevice remediation using steel casing or other accepted methods to seal off cavities in the rock ('Remediated Drilled Shaft-Rock') will be measured for payment to the nearest 0.1 foot from the top of bedrock to the bottom of the remediated drilled shaft for all diameters of drilled shafts for the piers shown on the plans. Any splicing of permanent steel casing or reinforcing steel is incidental to the Remediated Drilled Shaft-Common and Remediated Drilled Shaft-Rock unit bid prices. Any required concrete or grout pumped to reestablish drilling fluid return will be paid under the unit bid price for 'Cavity Stabilization' in Section 5.0.5 of this Special Note.

For 'Remediated Drilled Shaft-Common' and 'Remediated Drilled Shaft-Rock' there are three cases as follows:

- A. Where horizontal cavities are anticipated from the existing borings and are indicated on the plans, the unit bid price for 'Remediated Drilled Shaft-Common' will be used in lieu of the 'Drilled Shaft, Common' unit bid price and the 'Remediated Drilled Shaft-Rock' unit bid price will be used in lieu of the 'Drilled Shaft, Rock' unit bid price on shafts where 'Remediated Drilled Shaft-Common' and 'Remediated Drilled Shaft-Rock' are indicated in the plans.
- B. Where 'Rock Corings' performed by the contractor encounter cavities in the bedrock that were not indicated on the plans or by the existing borings and are greater than one foot in vertical dimension, the unit bid price for 'Remediated Drilled Shaft-Common' will be used in lieu of the 'Drilled Shaft, Common' unit bid price and the 'Remediated Drilled Shaft-Rock' unit bid price will be used in lieu of the 'Drilled Shaft, Rock' unit bid price. On these drilled shafts, the Contractor will be paid by deducting the quantity of unit bid price for 'Drilled Shaft, Common' and 'Drilled Shaft, Rock' and adding the quantity of unit bid price for 'Remediated Drilled Shaft-Common' and 'Remediated Drilled Shaft-Rock' based upon the revised quantities provided by the Engineer for these drilled shafts.

Where 'Rock Corings' performed by the contractor do not encounter cavities in the bedrock and quantities were assigned for 'Remediated

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- Drilled Shaft-Common' and 'Remediated Drilled Shaft-Rock', the pay items will revert back to the 'Drilled Shaft-Common' and Drilled Shaft-Rock' pay items.
- C. Where horizontal cavities are encountered (at locations where the existing or construction-phase borings did not indicate cavities in the bedrock) requiring remediated drilled shaft, the 'Remediated Drilled Shaft-Common' and 'Remediated Drilled Shaft-Rock' unit bid price will be paid in addition to the already performed unit bid price for 'Drilled Shaft, Common' and 'Drilled Shaft, Rock' to depth on that drilled shaft where the voids are encountered.

Permanent steel casing used within the bedrock to seal cavities and any required temporary steel casing will be incidental to the contract unit bid price for 'Remediated Drilled Shaft-Common' and the unit bid price for 'Remediated Drilled Shaft-Rock'. Grouting between any temporary steel casing and permanent steel casing is incidental to the unit price bid for 'Remediated Drilled Shaft-Common' and the unit bid price for 'Remediated Drilled Shaft-Rock'. The rock socket excavation below the 'Remediated Drilled Shaft-Rock' will be paid at the unit bid price for 'Drilled Shaft, Rock' for the specified rock socket diameter indicated in the contract plans.

5.05 Cavity Stabilization and Redrilling Cavity Stabilization

Concrete or grout used to seal cavities in the bedrock between 3 inches and 12 inches in thickness will be measured in cubic yards. Concrete or grout used to seal cavities in the bedrock to resume lost drilling fluid return during 'Remediated Drilled Shaft-Rock' will be measured in cubic yards. Redrilling through the cavity stabilization will be measured to the nearest 0.1 foot from the top of the concrete/grout to the elevation in the bedrock where the Contractor stopped drilling prior to placing cavity stabilization.

5.06 Rock Soundings and Rock Corings

Rock Soundings for subsurface exploration will be measured to the nearest 0.1 foot from the top of the encountered mudline or ground surface to the top of encountered bedrock. Depth from the barge deck to the mudline is incidental to the Rock Soundings unit bid price. Rock Corings for subsurface exploration will be measured to the nearest 0.1 foot from the top of encountered bedrock to the depth the rock core is extended below the top of encountered bedrock, including voids/cavities.

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5.1 Basis of Payment

5.1.1 Drilled Shaft, Common and Drilled Shaft, Rock

Payment for the accepted quantities of drilled shafts will be paid for at the contract unit price bid per linear foot of drilled shaft of the size and type shown. This will constitute full compensation for all material, labor and incidental costs necessary to complete the drilled shafts. No additional compensation will be permitted for shafts constructed larger in diameter than those shown on the plans.

5.1.2 Technique Drilled Shafts

Payment for the designated technique drilled shafts will be paid for at the contract unit price bid per each of the size and type shown in the plans for 'Technique Shaft' and 'Technique Shaft with Remediation'. This will constitute full compensation for all material (including, but not limited to, permanent casing, temporary casing, grout infill between casings, drilled shaft remediation, concrete and reinforcing steel), labor and incidental costs necessary to complete the technique drilled shafts, including excavation through soil and the rock drilling and any drilled shaft remediation to complete the designated rock socket length in the plans. No additional compensation will be permitted for a technique shaft constructed larger in diameter than that shown on the plans. Cavity stabilization and redrilling through cavity stabilization will be paid per the bid unit prices described in Section 5.1.4.

5.1.3 Remediated Drilled Shaft

Payment for the accepted quantities of remediation of horizontal cavities greater than 12 inches in thickness in the bedrock, including remediation of vertical crevices, will be paid for at the contract unit price bid for linear foot of remediated drilled shaft-common and remediated drilled shaft-rock for all diameters of drilled shafts shown on the plans.

5.1.4 Cavity Stabilization and Redrilling Cavity Stabilization

Payment for Cavity Stabilization to stabilize cavity excavation in the bedrock or for drilled shaft remediation will be paid at the contract unit price shown. Redrilling through the cavity stabilization will be paid at the contract unit price for Redrilling Cavity Stabilization for all diameters of drilled shafts shown on the plans.

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5.1.5 Rock Soundings and Rock Corings

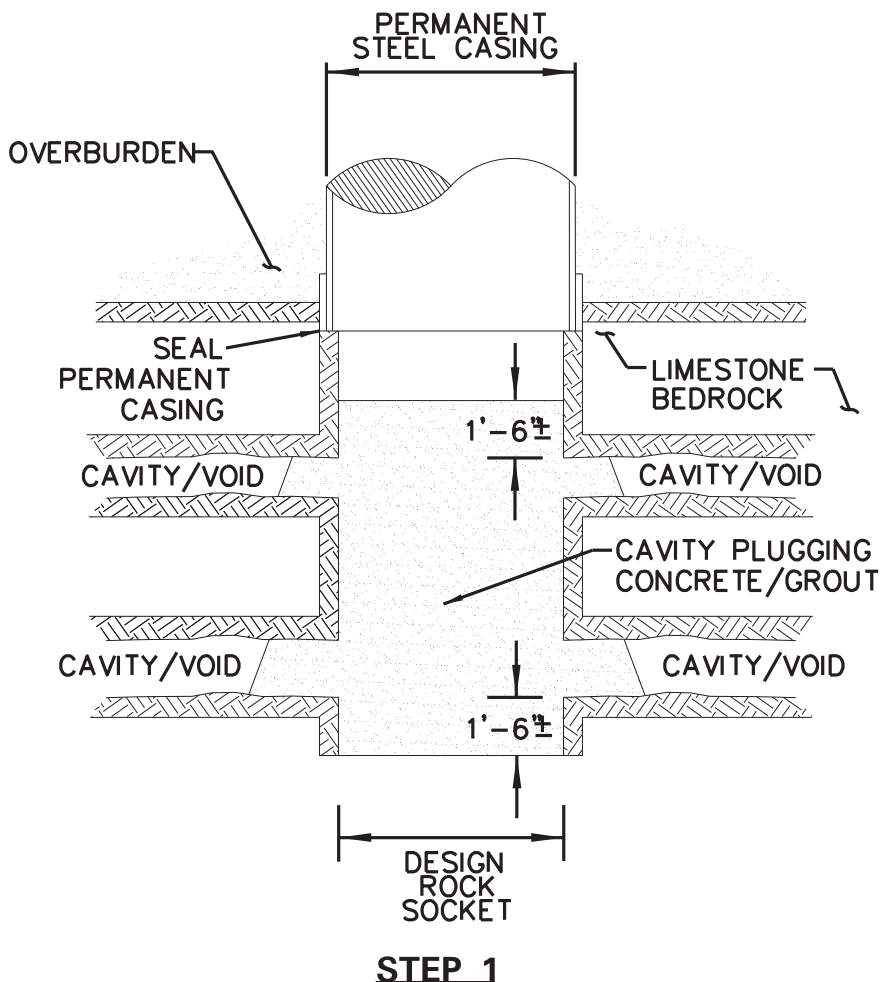
The Department will measure Rock Soundings (advancing the boring to bedrock) and Rock Corings shown on the plans, as specified in Section 5.0 of this Special Note, and as the Engineer directs, in linear feet to the nearest 0.1-foot. The Department will not measure or pay for subsurface exploration performed deeper than the elevations indicated on the plans and/or in this Special Note, unless directed by the Engineer, and will consider it incidental to these items of work. Additionally, the Department will consider all mobilization, equipment, labor, incidental items, and operations necessary to complete the boring operations incidental to these items of work.

Payment will be made under:

Code	Pay Item	Pay Unit
23583EC	Drilled Shaft-48 IN-Common	Linear Foot
23584EC	Drilled Shaft-42 IN-Rock	Linear Foot
23249EC	Drilled Shaft-72 IN Common	Linear Foot
23000EX	Drilled Shaft-66 IN (Rock)	Linear Foot
24732EC	Drilled Shaft-84 IN-Common	Linear Foot
24733EC	Drilled Shaft-78 IN-Rock	Linear Foot
22588NN	Technique Shaft	Each
24734EC	Technique Shaft with Remediation	Each
24735EC	Remediated Drilled Shaft-Common	Linear Foot
24736EC	Remediated Drilled Shaft-Rock	Linear Foot
24737EC	Cavity Stabilization	Cubic Yard
24738EC	Redrilling Cavity Stabilization	Linear Foot
20745ED	Rock Soundings	Linear Foot
20746ED	Rock Corings	Linear Foot

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APPENDIX



FOR INFORMATION ONLY

THE PROCEDURE DESCRIBED ON THIS DRAWING IS ONE FEASIBLE CAVITY SEALING REMEDIATION PROCEDURE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SUBMIT THE PROPOSED CAVITY SEALING PROCEDURE AS PART OF THE DRILLED SHAFT EXCAVATION PLAN SUBMITTAL.

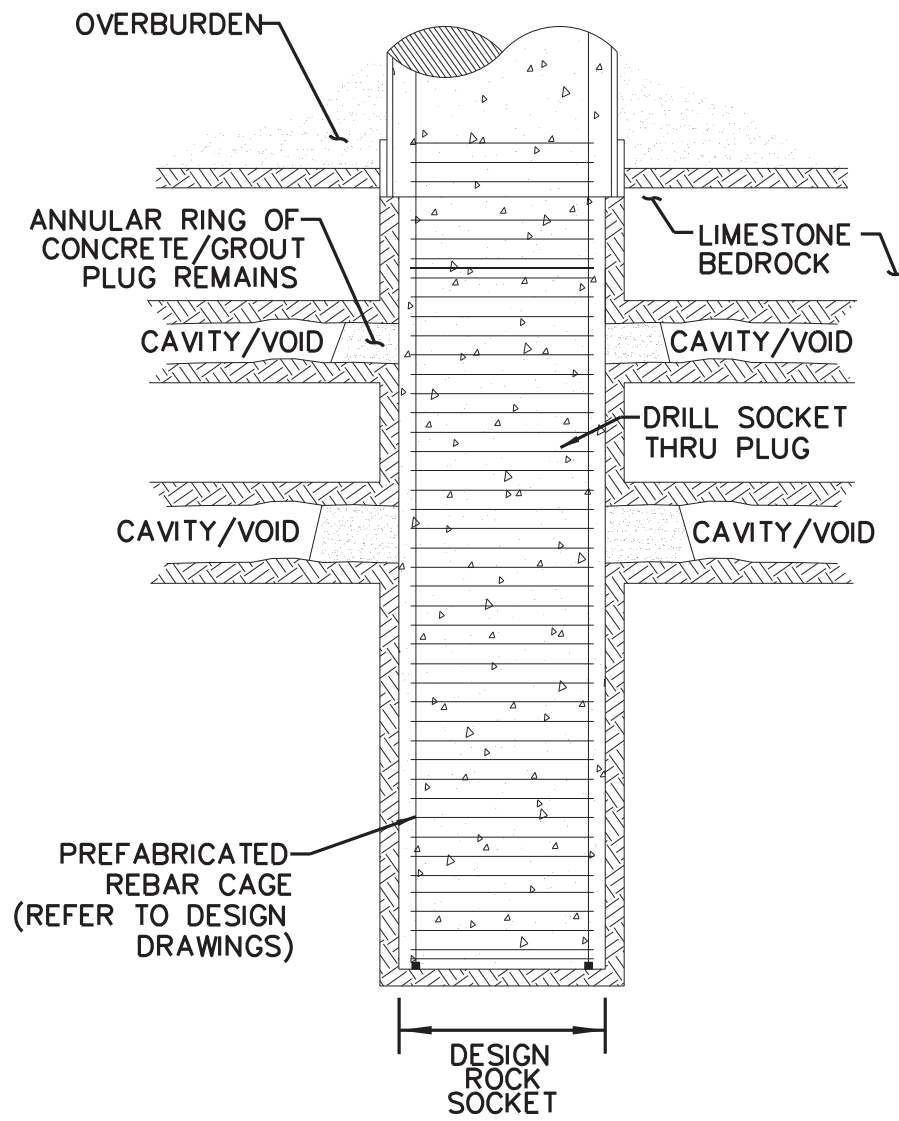
STEP 1:

1. INSTALL PERMANENT CASING THROUGH OVERBURDEN INTO TOP OF LIMESTONE. SEAL OVERBURDEN/ROCK INTERFACE. EXCAVATE MATERIAL FROM CASING.
2. ADVANCE ROCK SOCKET TO AN ELEVATION 1'-6"± BELOW BOTTOM LIMITS OF LOWEST CAVITY ENCOUNTERED IN BORINGS. A CAVITY IS DEFINED AS A VOID 3" TO 12" IN DIMENSION AT THE PERIMETER OF THE ROCK SOCKET. SONAR CALIPER ROCK SOCKET TO CONFIRM VOID DIMENSIONS.
3. TREMIE POUR CONCRETE OR GROUT MIX (CONCRETE/GROUT CAVITY STABILIZATION) AND SOCKET TO AN ELEVATION 1'-6"± ABOVE LIMITS OF UPPERMOST CAVITY.

SCALE: NOT TO SCALE

ITEM NUMBER
01-180.60

DATE: 11/07/14		CHECKED BY	
DESIGNED BY:			
DETAILED BY:			
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS			
COUNTY TRIGG			
ROUTE US 68	CROSSING LAKE BARKLEY		
SCHEMATIC-CAVITY REMEDIATION			
PREPARED BY Terracon Consulting Engineers and Scientists			SHEET NO. DS1 DRAWING NO.



STEP 2

FOR INFORMATION ONLY

THE PROCEDURE DESCRIBED ON THIS DRAWING IS ONE FEASIBLE CAVITY SEALING REMEDIATION PROCEDURE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SUBMIT THE PROPOSED CAVITY SEALING PROCEDURE AS PART OF THE DRILLED SHAFT EXCAVATION PLAN SUBMITTAL.

STEP 2:

1. AFTER INITIAL SET (MINIMUM 1,000psi COMPRESSIVE STRENGTH) DRILL OUT CONCRETE/GROUT PLUG AND REMAINING SOCKET DEPTH TO DESIGN SOCKET DIAMETER AND ELEVATION.
2. PERFORM SONAR CALIPER TEST TO VERIFY ANNULAR CONCRETE RING REMAINS IN THE PLUG AREA, AND VERIFY THAT NO ADDITIONAL CAVITIES ARE ENCOUNTERED BELOW CONCRETE PLUG.
3. INSTALL PREFABRICATED REBAR CAGE WITH GUIDES FOR CENTERING IN SOCKET AND CASING PER SPECIAL NOTE.
4. PLACE SHAFT CONCRETE PER SPECIAL NOTE.

SCALE: NOT TO SCALE

ITEM NUMBER
01-180.60

DATE: 11/07/14	CHECKED BY
DESIGNED BY:	
DETAILED BY:	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS	
COUNTY TRIGG	
ROUTE US 68	CROSSING LAKE BARKLEY
SCHEMATIC-CAVITY REMEDIATION	
PREPARED BY Terracon Consulting Engineers and Scientists	SHEET NO. DS2 DRAWING NO.

EL. ~359 FT.  NORMAL POOL(VARIES,
EL. ~348 FT. SEE NOTE 2)

MUDLINE

GROUT OR
SIMILAR
ANNULAR
BACKFILL6 OR 7-FT.-DIA.
PERMANENT CASING
(EXTENDED TO
BOTTOM OF VOID)TEMPORARY
SEAL AT
BEDROCK(VARIES,
EL. ~259 FT. SEE NOTE 2)

LIMESTONE BEDROCK

VOID

(VARIES,
EL. ~196 FT. SEE NOTE 2)CONCEPTUAL CAVITY
STABILIZATION LIMITS
(SEE NOTE 4)SEAL PERMANENT CASING AT
OR BELOW BOTTOM OF VOID
(BOTTOM OF REMEDIATED
DRILLED SHAFT)

EL. ~180 FT. (VARIES, SEE NOTE 2)

5.5 OR 6.5-FT.-DIA. ROCK SOCKET
(SEE PLANS FOR SPECIFIC SHAFT
DIAMETER AND SOCKET LENGTH)TYPICAL
KARST
AREA
DRILLED
SHAFT
(SEE PLANS
AND SPECIAL
NOTES FOR
SPECIFICATIONS
AND INSTALLATION
REQUIREMENTS)TEMPORARY OUTER
CASING (IF NEEDED)6.5 OR 7.5-FT.-DIA.
TEMPORARY
INNER CASING

VOID

NOTES:

1. POOL ELEVATIONS VARY SEASONALLY.
2. MUDLINE, TOP OF ROCK, SHAFT TIP AND VOID ELEVATIONS VARY THROUGHOUT THE SITE. SUBSURFACE DATA SHEETS PROVIDE ADDITIONAL INFORMATION AT BORING LOCATIONS.
3. THIS IS ONE POSSIBLE REMEDIATION METHOD. ALTERNATIVES MAY BE PROPOSED BY THE CONTRACTOR AND ARE SUBJECT TO DEPARTMENT ACCEPTANCE.
4. CAVITY STABILIZATION LIMITS SHOWN CONCEPTUALLY FOR QUANTITY ESTIMATE (IF NEEDED FOR FLUID CIRCULATION, MAY VARY).

SCALE: NOT TO SCALE

ITEM NUMBER

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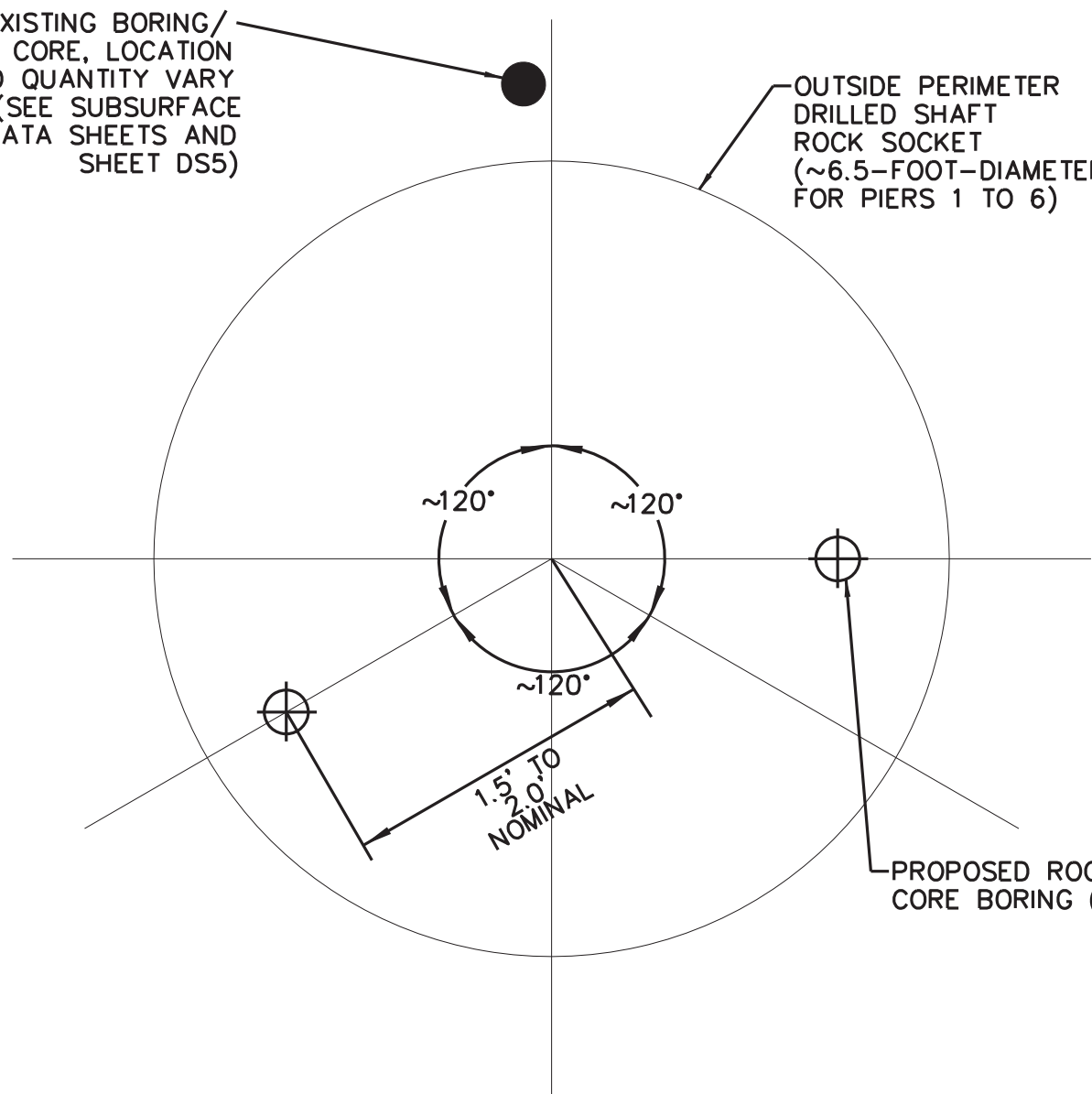
DESIGNED BY: _____

DETAILED BY: _____

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYSCOUNTY
TRIGGROUTE
US 68CROSSING
LAKE BARKLEY**SCHEMATIC-KARST REMEDIATION**PREPARED BY
Terracon
Consulting Engineers and ScientistsSHEET NO.
DS3
DRAWING NO.

EXISTING BORING/
ROCK CORE, LOCATION
AND QUANTITY VARY
(SEE SUBSURFACE
DATA SHEETS AND
SHEET DS5)

OUTSIDE PERIMETER
DRILLED SHAFT
ROCK SOCKET
(~6.5-FOOT-DIAMETER
FOR PIERS 1 TO 6)



PROPOSED ROCK
CORE BORING (TYP.)

TYPICAL ROCK CORE BORINGS PIERS 1 TO 6 – DRILLED SHAFTS

NOTE:

1. REFER TO SUBSURFACE DATA SHEETS AND SHEET DS5 IN THIS SPECIAL NOTE FOR EXISTING BORING/ROCK CORE LOCATIONS. ADJUST PROPOSED BORING/ROCK CORE LOCATIONS TO MAINTAIN A MINIMUM EDGE TO EDGE DISTANCE OF 1.5 FEET FROM EXISTING BORING LOCATIONS. LOCATE TWO BORING LOCATIONS SUCH THAT BOTH BORING LOCATIONS ARE WITHIN THE PERIMETER OF THE PROPOSED DRILLED SHAFT ROCK SOCKET. DRILLED SHAFT LOCATIONS, OTHER THAN THOSE SPECIFIED IN THIS SPECIAL NOTE (I.E. PIERS 1 TO 6), MAY REQUIRE BORINGS/ROCK CORE IF VOIDS ARE ENCOUNTERED AT THOSE SHAFT LOCATIONS DURING CONSTRUCTION. REFER TO SECTION 4.13 OF THIS SPECIAL NOTE FOR MAXIMUM HORIZONTAL LOCATION TOLERANCES AND ROCK CORE DEPTH CRITERIA.

2. SKETCH IS FOR ILLUSTRATION PURPOSES ONLY. CONTRACTOR WILL SUBMIT A PLAN SHOWING THE PROPOSED BORING LOCATIONS AND PROPOSED LOCATION TOLERANCES FOR ACCEPTANCE BY THE DEPARTMENT.

SCALE: NOT TO SCALE

ITEM NUMBER
01-180.60

DATE: 11/07/14		CHECKED BY	
DESIGNED BY:			
DETAILED BY:			
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS			
COUNTY TRIGG			
ROUTE US 68	CROSSING LAKE BARKLEY		
PIERS 1 TO 6 ROCK CORE			
PREPARED BY Terracon Consulting Engineers and Scientists			SHEET NO. DS4 DRAWING NO.

As-Drilled Locations						Bottom of Lowest Encountered Void Elev (ft.)
Pier	Boring	Northing	Easting	Latitude	Longitude	
1	B 5001	3459118.90	4267804.72	36.801490443	-87.981824860	No Voids Encountered
1	B 5002	3459095.642	4267795.27	36.801425963	-87.981855221	No Voids Encountered
1	B 5003	3459070.455	4267787.647	36.801356309	-87.981879190	No Voids Encountered
2	B 5004	3459029.813	4268060.50	36.801262639	-87.980944297	No Voids Encountered
2	B 5005	3459007.50	4268052.36	36.801200853	-87.980970267	No Voids Encountered
2	B 5006	3458981.234	4268044.61	36.801128217	-87.980994589	No Voids Encountered
3	B 5007	3458941.53	4268315.104	36.8010370	-87.9800678	No Voids Encountered
3	B 5008	3458918.98	4268307.812	36.8009746	-87.9800909	No Voids Encountered
3	B 5009	3458893.35	4268298.50	36.8009036	-87.9801206	225.9
4	B 5010	3458856.19	4268570.534	36.8008194	-87.9791888	No Voids Encountered
4	B 5011	3458829.43	4268563.848	36.8007455	-87.9792095	237
4	B 5012	3458805.68	4268554.359	36.8006797	-87.9792399	No Voids Encountered
5	B 5013E	3458758.12	4268844.886	36.8005681	-87.9782441	No Voids Encountered
5	B 5014E	3458735.48	4268835.949	36.8005054	-87.9782728	208.5
5	B 5015E	3458710.84	4268828.97	36.8004373	-87.9782946	No Voids Encountered
6	B 5016	3458678.88	4269079.823	36.800365983	-87.977435568	No Voids Encountered
6	B 5017	3458655.656	4269074.26	36.800301855	-87.977452667	No Voids Encountered
6	B 5018	3458627.79	4269064.366	36.800224698	-87.977484176	No Voids Encountered

- Notes:
1. Location data is for the center of the boring.

2. Borings where no voids were encountered within the explored depth are indicated by "No Voids Encountered".

DATE: 11/07/14		CHECKED BY	
DESIGNED BY: _____		_____	
DETAILED BY: _____		_____	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS			
COUNTY TRIGG			
ROUTE US 68	CROSSING LAKE BARKLEY		
EXISTING BORING LOCATIONS			
ITEM NUMBER		PREPARED BY	SHEET NO.
01-180.60		Terracon Consulting Engineers and Scientists	DS5 DRAWING NO.

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Lake Barkley Bridge

SPECIAL NOTE FOR NON-DESTRUCTIVE TESTING IN DRILLED SHAFTS

Trigg County –US68/KY80 Bridge over Lake Barkley

The following sections provide the requirements for non-destructive testing (Sonar Caliper, Crosshole Sonic Logging and Thermal Integrity Profiling) of the drilled shaft foundations, including technique shafts, schedule requirements for submittals, reporting requirements and Contractor/Testing Subcontractor/Department responsibilities. The purpose of the non-destructive testing is to evaluate whether the Contractor's means and methods are suitable for proposed drilled shaft foundation construction and to potentially detect air-, clay- or debris-filled voids or other discontinuities along the perimeter of the drilled shaft rock sockets.

1.0 Sonar Caliper Testing of Drilled Shafts

1.1 Description

Sonar Caliper (SC) Testing will be used to evaluate verticality, to detect any void spaces along the perimeter of the shaft design diameter, and to provide a written record and rock socket profile for each shaft prior to reinforcement or concrete placement. The Contractor will be responsible for obtaining the services of a SC Testing Firm experienced with SC testing and approved by the Engineer. The Contractor will be responsible for scheduling and coordinating the testing and presentation of data to the Engineer.

The calipering system will use one or more radial-spaced ultrasonic transceivers to transmit and receive acoustic signals between the tool and the borehole wall.

As directed by the Engineer, perform SC Testing after rock excavation is completed to the design bottom of shaft. If karst or other features are detected, additional SC testing may be directed by the Engineer.

1.2 SC Testing and Evaluation of Test Results

Make submittals via SharePoint software in accordance with the Project requirements for submittals. See Table 1 below. The Department will respond to the Contractor regarding acceptability of submittals within ten (10) business days, unless indicated otherwise in this special note. A "Business Day" is defined as any day except Saturdays, Sundays and Holidays, as defined in Section 101.03 of the Standard Specifications.

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Table 1 – Schedule of SC Submittals			
Submittal Number	Submittal Item	Calendar Days	Event
1	Technical Proposal with SC Testing Firm qualifications	60 before	Start of Drilled Shaft Construction
2	SC Preliminary Testing Reports	6 HOURS After	Completion of testing on an individual drilled shaft
3	SC Final Testing Reports	10 After	Completion of testing on an individual drilled shaft
Provide all submittals and reports in .pdf format			

1.2.1 Technical Proposal

Submit a technical proposal prepared by the SC Testing Firm that addresses the testing procedures and qualifications and experience of the testing firm (Submittal No. 1 in Table 1.) Include at least 2 similar deep foundation projects for which the testing organization has been engaged in SC Testing. Include an example of a 3 dimensional wire frame computer file with a verticality analysis prepared according to the criteria defined below. Use personnel having a minimum of 2 similar deep foundation projects experience in SC Testing and interpretation. Within 10 business days, the Department will review the proposal and report to the Contractor whether the SC Testing Firm is approved.

1.2.2 Testing

Perform the SC Testing using the following steps:

1. Caliper is positioned over drilled hole along with lowering assembly (provided by SC Testing Firm).
2. Caliper is reset and calibrated at the zero degree reading.
3. Profile is taken in casing with known diameter to calibrate acoustic velocity.
4. Depth increment is set into software.
5. Caliper measures 360-degree profile.
6. Vertical and angular head position and range to shaft wall is captured.

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7. Complete point profile is transferred to CAD program in dgn format.
8. Caliper is lowered at desired depth increment.
9. Steps 4 to 8 are repeated until the bottom of shaft socket is reached.
10. Upon reaching the bottom of the shaft, rotate the caliper 90 degrees, and scan the bearing surface at the base of the shaft.

To acquire verticality information, the caliper head will be affixed to a guide cable that is weighted near the bottom of the shaft and positioned plumb.

Perform the SC Testing process on all finished excavated shafts. Provide access to the top of shaft for testing personnel and equipment. Perform the SC Testing process in accordance with generally accepted SC Testing methods. At a minimum, take caliper readings every 10 feet in casing and every 6 inches in rock strata. If a feature is identified on the real time visual display, the Engineer may decrease the testing interval as necessary to improve the definition of the feature at no additional cost. Perform the SC testing along the base of the shaft by turning the sonar head 90 degrees and mounting it in a manner that allows profiling of the shaft base. Determine the top of casing elevation and calculate the station and offset of the geometric center of the top of casing, and provide this information to the Engineer and to the SC Testing Firm. Provide these services at no additional cost to the Department.

Employ the services of an experienced SC Testing company to record a 360-degree profile of the finished rock socket for each drilled shaft. After each rock socket is completed, use the SC Testing process to measure the gross diameter and shape of each drilled shaft for the entire shaft length in the rock socket.

1.2.3 Test Reports

Provide real-time data regarding the shaft verticality, shaft wall profile, and bottom profiling to the Engineer on site as the SC Testing is in progress.

Within 6 hours after completing the SC Testing, perform all required filtering and analyses required to provide a 3 dimensional wire frame computer file in Microstation format (.dgn) and transmit the computer file to the Engineer (Submittal No. 2 in Table 1.) If testing is completed between 3:00 pm and 3:00 am prevailing local time, transmit the computer file to the Engineer no later than 9:00 am prevailing local time the following morning. Include a verticality analysis with the wire frame computer file consisting of the following:

1. The vertical alignment vector (magnitude and direction of tilt) of the casing from the top to the bottom of casing.

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2. The vertical alignment vector (magnitude and direction of tilt) from the top to bottom of the rock socket (when the rock socket is profiled);
3. The magnitude and direction of the offset of the geometric center of the rock socket relative to the geometric center of the casing at the transition between the casing and the rock socket (when the rock socket is profiled).

In addition, provide the following in pdf format:

1. Screen shots of the bottom profiling; and
2. Any cavities, cracks or void in the rock socket wall, including a general description with depth and elevation of the cavities, cracks or voids.

Within 10 business days after completion of each test, provide a pdf copy of the final report to the Engineer (Submittal No. 3 in Table 1), including, as a minimum, the following information:

1. Date of test;
2. Shaft No., and reference elevation,
3. Wire frame plots of the shaft from representative view points,
4. A plot of shaft volume vs. depth,
5. Analysis of shaft verticality (as defined above),
6. Discussion of the bottom profile results; and
7. Description and plot of any shaft wall voids, cracks, or cavities encountered.
8. A narrative which explains all aspects of the test, results and analyses.

1.2.4 Evaluation of SC Test Results

Allow direct communication between the SC Testing Firm and the Department. If the SC Testing Firm is different than the CSL and TIP testing firms, allow direct contact between the SC and CSL/TIP testing firms.

The Engineer will review the "real-time" data collected by the SC Testing Firm during the testing process at each shaft. If the bottom scan performed during SC Testing indicates that excessive sediment is present on the bottom, perform additional cleanout at the direction of the Engineer.

The Engineer will evaluate the wire frame computer file, including verticality analysis, and determine if the construction tolerances have been met and inform the Contractor. If the casing is not within the specified tolerances, adjust the casing at no cost to the Department. Perform additional SC Testing from the bottom of casing to the top of the casing at no cost to the Department. Continue adjustment and testing at no cost to the Department until the construction tolerances have been met.

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If discontinuities or features noted by the testing firm in the shaft excavation are deemed sufficient by the Engineer to potentially cause concrete loss or soil intrusion during concrete placement, or loss of nominal resistance, the Engineer will meet with the Contractor to discuss remediation.

Continue with placement of reinforcement and concrete in the shaft only after receiving written approval from the Engineer to do so, based on evaluation of the SC test results.

2.0 Crosshole Sonic Logging

2.1 Description

Crosshole Sonic Logging (CSL) is a nondestructive method to test the integrity of drilled shafts. It is the responsibility of the Contractor to supply all equipment and materials necessary to perform this testing and for obtaining the services of a CSL Testing Firm, which is experienced with CSL testing and approved by the Engineer, to perform the testing.

The Contractor will be responsible for providing:

1. access tubes to be used for CSL testing of the drilled shafts;
2. watertight shoes, watertight caps, and non-shrink grout;
3. suitable working space and access to every shaft;
4. a reliable 600 watt (minimum) generator; and
5. any other equipment or materials necessary to accomplish the testing.

2.2 Materials

2.2.1 Access Tubes

1. Provide access tubes meeting the requirements below:
 - a. 2 inch ID schedule 40 steel pipe conforming to ASTM A 53, Grade A or B, Type E, F, or S;
 - b. contains round, regular internal diameters free of defects or obstructions, including any at pipe joints;
 - c. capable of permitting the free, unobstructed passage of a 1.5-inch-diameter source and receiver probes; and
 - d. watertight and free from corrosion with clean internal and external faces to ensure passage of the probes and a good bond between the concrete and the tubes.
2. Provide watertight shoes on the bottom and removable watertight caps on the top of the tubes.
3. The Engineer will accept access tubes based on visual inspection and certification and the steel pipe meets the requirements above.

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2.2.2 Grout

Provide non-shrink grout to fill the access tubes and any cored holes at the completion of the CSL tests. Use grout conforming to Section 601.03.03 of the Standard Specifications.

2.3 Execution

2.3.1 Access Tube Installation

1. Install 6 access tubes as shown in Section 2.4.2 of this Special Note in each of the drilled shafts having a rock socket diameter of 5.5 feet or greater, unless directed by the Engineer to omit any access tubes. Install 4 access tubes as shown in Section 2.4.2 of this Special Note in each of the drilled shafts having a rock socket diameter of 3.5 feet to 5 feet, unless directed by the Engineer to omit any access tubes.
2. Securely attach the CSL tubes that are along the inside periphery to the spiral reinforcement. Wire-tie the tubes a minimum of every 3 ft. so they will stay in position during placement of reinforcement and concrete. Place the tubes so they will be parallel with each other and as near to vertical as possible in the finished shaft. Even moderate bending of the tubes will result in large regional variations in the data.
3. Place the tubes from 6 inches above the shaft tip to at least 3 ft. above the top of rebar cage, at least 3 ft. above water level, at least to the top of concrete, and at least 3 ft. above the top of casing. Under no circumstances may the tubes be allowed to come to rest on the bottom of the excavation.
4. Ensure that any joints in the tubes are watertight.
5. During placement of the reinforcement cage, exercise care so that the tubes will not be damaged to the extent that would prevent a 1.5 inch diameter probe from passing through them.
6. After placing the reinforcing cage and before beginning concrete placement, **fill the tubes with clean potable water** and cap or seal the tube tops to keep debris out of the tubes. Replace the watertight caps immediately after filling the tubes with water.
7. Before placing concrete, investigate at least one tube per shaft to make sure that there are no bends, crimps, obstructions or other impediments to the free passage of the testing probes.
8. During removal of the caps from the tubes, exercise care so as not to apply excess torque, hammering, or other stresses which could break the bond between the tubes and concrete.
9. After concrete placement and before the beginning of CSL testing, inspect the access tubes and report any access tubes that the 1.5 inch diameter test probe cannot pass through to the Engineer. The Engineer will make an evaluation to determine if the CSL testing can be successfully performed without the tube(s); the Engineer may require the contractor to, at its own expense, replace one or more

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tubes with 2-inch-diameter holes cored through the concrete for the entire length of the shaft, excluding the bottom 6 inches. Unless directed otherwise by the Engineer, locate core holes approximately 6 inches inside the reinforcement such that it does not damage the reinforcement. For each core hole drilled, record a log with descriptions of inclusions and voids in the cored holes and submit a copy of the log and photographs to the Engineer. Preserve the cores, identify as to location and make available for inspection by the Engineer.

2.3.2 Grouting

After completion of the CSL and TIP testing, evaluation of results and upon being directed by the Engineer, remove the water from the access tubes and any cored holes, completely fill the tubes and holes with approved grout. After grouting, cut the tubes flush with the tops of the drilled shafts.

2.4 CSL Testing and Evaluation of Test Results

Make submittals via SharePoint software in accordance with the Project requirements for submittals. See Table 2 below. The Department will respond to the Contractor regarding acceptability of submittals within ten (10) business days, unless indicated otherwise in this special note. A "Business Day" is defined as any day except Saturdays, Sundays and Holidays, as defined in Section 101.03 of the Standard Specifications.

Table 2 – Schedule of CSL Submittals			
Submittal Number	Submittal Item	Calendar Days	Event
1	Technical Proposal with CSL Testing Firm qualifications	60 before	Start of Drilled Shaft Construction
2	CSL Testing Reports	5 After	Completion of testing on an individual drilled shaft
Provide all submittals and reports in .pdf format			

2.4.1 Technical Proposal

Submit a technical proposal prepared by the CSL Testing Firm that addresses the testing procedures and qualifications and experience of the testing firm. Include at least 3 similar deep foundation projects for which

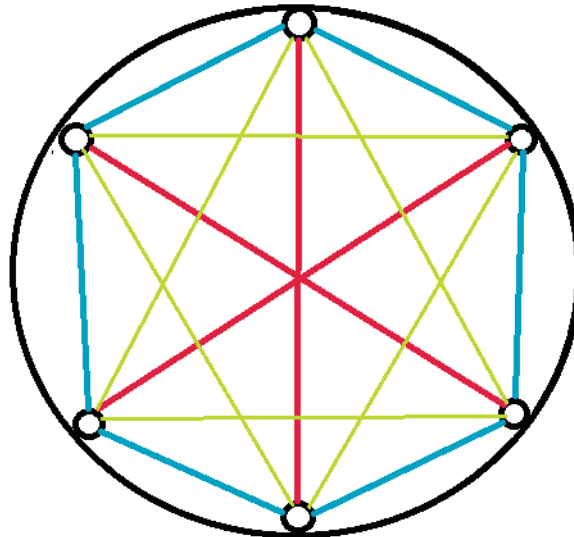
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the testing organization has been engaged in CSL Testing. Use personnel having a minimum of 3 similar deep foundation projects experience in CSL Testing and interpretation. Within 10 business days, the Department will review the proposal and report to the Contractor whether the CSL Testing Firm is approved.

2.4.2 Testing

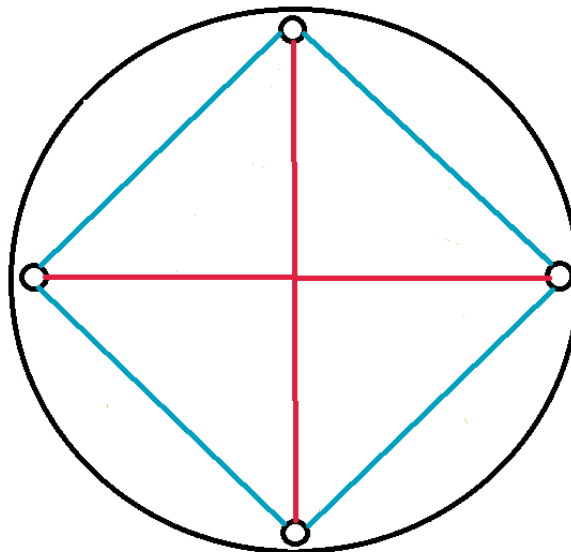
1. Provide access to the top of the shaft for testing personnel and equipment.
2. Perform CSL testing on all shafts, unless directed otherwise by the Engineer.
3. Perform CSL testing in general accordance with ASTM D 6760.
4. Perform CSL testing on all completed shafts designated for testing by the Engineer, after the shaft concrete has cured at least 72 hours and has obtained a minimum strength of 2500 psi.
5. For drilled shafts with diameters of 5.5 feet and greater, obtain a minimum of 15 CSL logs per shaft (6 perimeter, 3 major diagonal and 6 minor diagonal logs), unless otherwise directed by the Engineer (see figure below). For drilled shafts with diameters of 3.5 feet to 5 feet, obtain a minimum of 6 CSL logs per shaft (4 perimeter and 2 major diagonal logs), unless otherwise directed by the Engineer (see figure below).
6. If the CSL testing firm believes that additional testing is required (such as Angled CSL, Crosshole Tomography, Singlehole Sonic Logging, or Sonic Echo/Impulse Response, etc.), contact the Engineer immediately. The Department will determine if additional testing is required, and such testing, if not due to a drilled shaft defect, would be paid for using a change order.

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Proposed CSL Tube and Reading Configuration

5.5 ft. to 7 ft. Diameter Shafts – 6 CSL Tubes
3 Major Diagonal Readings
6 Perimeter Readings
6 Minor Diagonal Readings



Proposed CSL Tube and Reading Configuration

3.5 ft. to 5 ft. Diameter Shafts – 4 CSL Tubes
2 Major Diagonal Readings
4 Perimeter Readings

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2.4.3 Test Reports

1. Submit a test report prepared by the CSL Testing Firm within 5 business days of completion of testing which, as a minimum, contains:
 - a. Date of test;
 - b. Plan Shaft No. and Reference Elevation;
 - c. Schematic showing a plan view of the access tube locations;
 - d. CSL logs with reference elevations;
 - e. CSL logs presented for each tube pair tested with any discontinuity zones indicated on the logs and discussed in the report as appropriate;
 - f. Analyses of initial pulse arrival time versus depth or velocity versus depth and
 - g. Analyses of pulse energy/amplitude versus depth.
 - h. A narrative portion of the report will be used to present items a through f.
2. Complete all reports using English units.

2.4.4. Evaluation of CSL Test Results

1. Allow direct communication between the CSL Testing Firm and the Department.
2. The Department will evaluate the CSL test results in the test report to determine whether or not the drilled shaft integrity is acceptable. Within 5 business days after receiving a test report, the Engineer will report to the Contractor whether the construction is acceptable or additional analyses are needed. Thermal Integrity Testing (TIP) as described in Section 3.0 will also be used by the Department to determine the presence of anomalies.
3. Perform CSL testing on the first shaft constructed. Continue with subsequent drilled shaft rock socket excavation and concrete placement only after receiving written approval and acceptance of the first shaft of each specified diameter, based on the results and analysis of the CSL testing for the first shaft. Drilled shaft operations such as casing placement and overburden excavation will be allowed during the waiting period.
4. Continue with construction of the structure above the drilled shafts only after receiving written approval from the Engineer to do so, based on evaluation of the CSL test results.
5. If the CSL records are inconclusive (e.g. records do not clearly indicate discontinuity, good conditions or missing data), the Engineer may require additional testing, such as Angled CSL, or Singlehole Sonic Logging or concrete cores to sample the concrete in question to verify shaft conditions. If core samples are needed, obtain cores with a minimum diameter of 2 inches using a double tube core barrel at a minimum of 4 locations selected by the Department, unless directed otherwise by the Engineer. Unless directed otherwise by the

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Engineer, locate core holes approximately 6 inches inside the reinforcement such that they do not damage the reinforcement. For each core hole drilled, record a log with descriptions of inclusions and voids in the cored holes and submit a copy of the log to the Engineer. Place the cores in crates properly marked showing the shaft depth at each interval of core recovery. Transport the cores and logs to the Geotechnical Branch in Frankfort for inspection and testing. Grout the core holes in accordance with Section 2.3.2 above.

6. If the additional testing or evaluation of cores indicate that concrete for any drilled shaft on which additional testing or coring was required is acceptable, the Department will pay for the direct cost of additional testing and concrete coring and grouting by change order. If the additional testing or evaluation of cores indicates that the concrete for any drilled shaft concrete is unacceptable, the additional testing and concrete coring and grouting will be at the expense of the Contractor.
7. If discontinuities are found, an independent structural and/or geotechnical consultant hired by the Contractor will perform structural and/or geotechnical evaluation at the expense of the Contractor. Hire consultants who are prequalified by KYTC in applicable areas. Based on the design criteria established for the structure and the evaluation of the independent structural engineer, the Engineer will assess the effects of the defects on the structural performance of the drilled shaft. If the results of the analyses indicate that there is conclusive evidence that the discontinuity will result in inadequate or unsafe performance under the design loads, as defined by the design criteria for the structure, the Engineer will reject the shaft.
8. If any shaft is rejected, provide a plan for remedial action to the Engineer for approval. Any modifications to the foundation shafts and/or other substructure elements caused by the remedial action will require calculations and working drawings by consultant(s) hired by the contractor, at the expense of the Contractor, which will be subject to review by the Engineer. Begin remediation operations only after receiving approval from the Engineer for the proposed remediation. All remedial action will be at no cost to the Department and with no extension of contract time.

3.0 Thermal Integrity Profiling

3.1 Description

Thermal Integrity Profiling (TIP) will be used as part of the program to test the integrity of drilled shafts. The Contractor will be responsible for supplying all equipment and materials necessary to perform this testing, and obtaining the services of a TIP Testing Firm, experienced with TIP testing and approved by the Engineer, to perform the testing. TIP testing will be performed using the CSL

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tubes installed in the drilled shafts. Proposed alternate methods of performing the TIP testing may be considered by the Department.

Alternate methods of performing the TIP testing would be subject to acceptance by the Department, and installation of any sensors/instrumentation to the reinforcing cage would be incidental to the applicable contract unit bid price for TIP Testing. Ensuring that the TIP instrumentation is operational and provides the required information is the responsibility of the TIP Testing Firm. Overseeing the installation of the TIP testing instrumentation and properly training the Contractor in the installation of the TIP testing instrumentation is the responsibility of the TIP Testing Firm and is incidental to applicable unit bid price for TIP Testing. Any additional training for the Contractor is required for the TIP instrumentation, it is the responsibility of the TIP Testing Firm and is incidental to applicable unit bid price for TIP Testing.

The Contractor will be responsible for providing:

1. wires or probes which will be used for TIP testing of the drilled shafts;
2. dewatering equipment for CSL tubes if probes will be used;
3. suitable working space and access to every shaft;
4. a reliable 600 watt (minimum) generator; and
5. other equipment or materials necessary to accomplish the testing.

3.2 Materials

Refer to Section 2.2 for CSL tube materials.

3.3 Execution

3.3.1 Access Tube Installation

1. Refer to CSL access tube installation in Section 2.3.1 of this Special Note.

3.3.2 Grouting

After completion of the TIP and CSL testing, evaluation of results and upon being directed by the Engineer, remove the water from the access tubes and any cored holes, completely fill the tubes and holes with approved grout. After grouting, cut the tubes flush with the tops of the drilled shafts.

3.4 TIP Testing and Evaluation of Test Results

Make submittals via SharePoint software in accordance with the Project requirements for submittals. See Table 3 below. The Department will respond to the Contractor regarding acceptability of submittals within ten (10) business days, unless indicated otherwise in this special note. A "Business Day" is defined as

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any day except Saturdays, Sundays and Holidays, as defined in Section 101.03 of the Standard Specifications.

Table 3 – Schedule of TIP Submittals			
Submittal Number	Submittal Item	Calendar Days	Event
1	Technical Proposal with TIP Testing Firm qualifications, including any alternate testing methods and information required for alternate methods discussed in Section 3.1	60 before	Start of Drilled Shaft Construction
2	TIP Testing Reports	5 After	Completion of testing on an individual drilled shaft

Provide all submittals and reports in .pdf format

3.4.1 Technical Proposal

Submit a technical proposal prepared by the TIP Testing Firm that addresses the testing procedures and qualifications and experience of the testing firm. It is acceptable for the TIP and CSL Testing Firm to be the same firm, provided they meet requirements for both TIP (this Section) and CSL (Section 2.4.1) Testing Firms. Include at least 3 similar deep foundation projects for which the testing organization has been engaged in TIP Testing. Use personnel having a minimum of 3 similar deep foundation projects experience in TIP Testing and interpretation. Within 10 business days, the Engineer will review the proposal and report to the Contractor whether the TIP Testing Firm is approved.

3.4.2 Testing

1. Provide access to the top of the shaft for testing personnel and equipment.
2. Perform TIP testing on all shafts, unless directed otherwise by the Engineer.
3. Perform TIP testing in accordance with generally accepted TIP Testing methods.
4. Perform TIP testing on all completed shafts designated for testing by the Engineer, within the time frame indicated by the TIP testing firm after of the completion of concrete placement in the drilled shaft. Do not exceed 60 hours after completion of the placement of the drilled shaft concrete.
5. If wires are used, verify the length of the tubes and install weights on the wires at the bottom to ensure adequate tension along the length of the wire as they are lowered and secured at the top of the access tube.

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6. If probes are used, verify the length of the tubes and pump water from the tubes prior to testing.
7. Perform TIP testing in each CSL tube located in shaft designated for testing.
8. Immediately report potential local discontinuities indicated by locally low temperatures relative to the average temperature at that depth, or average temperatures significantly lower than the average temperatures at other depths to the Department.
9. If discontinuities are detected in the field, perform any confirmatory TIP testing deemed necessary by the TIP Testing Firm at no additional cost to the Department.

3.4.3 Test Reports

1. Submit a test report prepared by the TIP Testing Firm within 5 business days of completion of testing which, as a minimum, contains:
 - a. Date of test;
 - b. Plan Shaft No. and Reference Elevation;
 - c. Schematic showing a plan view of the access tube locations;
 - d. Graphical displays of all temperature measurements versus depth;
 - e. Indication of unusual temperatures, particularly significantly cooler local deviations of the average at any depth from the overall average over the entire length;
 - f. The overall average temperature. This temperature is proportional to the average radius computed from the actual total concrete volume installed (assuming a consistent concrete mix throughout). Radius at any point can then be determined from the temperature at that point compared to the overall average temperature;
 - g. Variations in temperature between wires (at each depth) which may correspond to variations in cage alignment (where concrete volume is known, the cage alignment or offset from center should be noted); and
 - h. Where shaft specific construction information is available (e.g. elevations of the top of shaft, bottom of casing, bottom of shaft, etc.), these values should be noted on all pertinent graphical displays.
 - i. Drilled shaft radius calculations and the shaft quality, based upon the collected data, as well other available data, such as, as shaft alignment and wall profile from the SC Testing, top/bottom shaft/concrete elevations and concrete volume records collected during construction of the drilled shaft.
 - j. A narrative portion of the report which addresses items a through i above.
2. Complete all reports using English units.

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3.4.4 Evaluation of TIP Test Results

1. Allow direct communication between the TIP Testing Firm and the Department.
2. The Engineer will evaluate the TIP test results in the test report to determine whether or not the drilled shaft integrity is acceptable. Within 5 business days after receiving a test report, the Engineer will report to the Contractor whether the construction is acceptable or additional more detailed analyses are needed.
3. Perform TIP testing on the first shaft constructed. Continue with subsequent drilled shaft rock socket excavation and concrete placement only after receiving written approval and acceptance of the first shaft, based on the results and analysis of the TIP testing for the first shaft. Drilled shaft operations such as casing placement and overburden excavation will be allowed during the waiting period.
4. Continue with construction of the structure above the drilled shafts only after receiving written approval from the Engineer to do so, based on evaluation of the TIP and CSL test results.
5. If the TIP and the CSL records are inconclusive, the Engineer may require additional testing (such as Angled CSL, Crosshole Tomography, Singlehole Sonic Logging, or Sonic Echo/Impulse Response, etc.) or concrete cores to sample the concrete in question to verify shaft conditions. If either the TIP or CSL records are inconclusive, the Engineer may elect to require additional testing, based on the results of the conclusive TIP or CSL records. If core samples are needed, obtain cores with a minimum diameter of 2 inches, double tube core barrel at a minimum of four locations specified by the Department, unless directed otherwise by the Engineer. Unless directed otherwise by the Engineer, locate core holes approximately 6 inches inside the reinforcement such that they do not damage the reinforcement. For each core hole drilled, record a log with descriptions of inclusions and voids in the cored holes and submit a copy of the log to the Engineer. Place the cores in crates properly marked showing the shaft depth at each interval of core recovery. Transport the cores and logs to the Geotechnical Branch in Frankfort for inspection and testing. Grout the core holes in accordance with Section 3.3.2 above.
6. If the additional testing or evaluation of cores indicate that concrete for any drilled shaft on which additional testing or coring was required is acceptable, the Department will pay for the direct cost of additional testing and concrete coring and grouting by change order. If the additional testing or if evaluation of cores indicate that the concrete for any drilled shaft concrete is unacceptable, the additional testing and concrete coring and grouting will be at the expense of the Contractor.
7. If defects are found, the original structural designer will perform structural and/or geotechnical analyses, at the expense of the

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Contractor, based on the design criteria established for the structure to assess the effects of the defects on the structural performance of the drilled shaft. If the results of the analyses indicate that there is conclusive evidence that the defects will result in inadequate or unsafe performance under the design loads, as defined by the design criteria for the structure, the Engineer will reject the shaft.

8. If any shaft is rejected, provide a plan for remedial action to the Engineer for approval. Any modifications to the foundation shafts and/or other substructure elements caused by the remedial action will require calculations and working drawings by independent consultant(s) hired by the Contractor, at the expense of the Contractor. The calculations and working drawings will be reviewed by the Engineer. Begin remediation operations only after receiving acceptance from the Engineer for the proposed remediation. All remedial action will be at no cost to the Department and with no extension of contract time.

4.0 Measurement and Payment

4.1 Method of Measurement Sonar Calipering

The Department will pay for the authorized and accepted quantities of "Sonar Calipering" at the contract unit price per test for both production and technique drilled shafts. This will constitute full compensation for all costs associated with providing access for testing personnel and equipment, performing the SC Testing, and reporting the results to the Engineer. Payment for the SC Testing will be at the contract unit price per SC Test. Payment for each test required by the Engineer will be the same regardless of whether the testing is performed after casing installation and overburden excavation or after rock excavation. Turning the sonar head and profiling the bottom of the excavation is incidental to the SC Testing unit bid price. If the Engineer requires both tests on the same shaft, payment will be for 2 tests. Any additional testing required to verify verticality after casing adjustments will be at the expense of the Contractor.

4.2 Method of Measurement CSL Testing

The Department will pay for the authorized and accepted quantities of "CSL Testing" at the contract unit price per each shaft tested (production and technique drilled shafts). This will constitute full compensation for all costs associated with providing access for testing personnel and equipment, performing the CSL Testing in a single shaft, and reporting the results to the Engineer.

Installation of CSL Access Tubing is incidental to the applicable contract unit bid price for Drilled Shaft, Common, and Drilled Shaft, Solid Rock. This will constitute all costs and delays associated with installing the CSL Access Tubing

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in a single shaft, including but not limited to providing and installing access tubing, providing and installing all required bracing for access tubes, providing and placing grout in access tubes.

The Department will pay for the direct cost of additional testing and concrete coring, authorized by the Engineer, required to investigate shafts with inconclusive CSL records if evaluation of the additional testing or cores indicates that concrete for that drilled shaft is acceptable using a change order. This will constitute full compensation for all costs and delays associated with performing additional tests, obtaining and delivering concrete cores to the Geotechnical Branch, and grouting core holes.

4.3 Method of Measurement TIP Testing

The Department will pay for the authorized and accepted quantities of "TIP Testing" at the contract unit price per each shaft tested (production and technique drilled shafts). This will constitute full compensation for all costs associated with providing access for testing personnel and equipment, performing the TIP Testing in a single shaft, and reporting the results to the Engineer.

Installation of CSL/TIP Access Tubing is incidental to the applicable contract unit bid price for Drilled Shaft, Common, and Drilled Shaft, Solid Rock. This will constitute all costs and delays associated with installing the CSL Access Tubing in a single shaft, including but not limited to providing and installing access tubing, providing and installing all required bracing for access tubes, providing and placing grout in access tubes.

The Department will pay for the direct cost of additional testing and concrete coring, authorized by the Engineer, required to investigate shafts with complex or inconclusive TIP records on a if evaluation of the additional testing or cores indicates that concrete for that drilled shaft is acceptable using a change order. This will constitute full compensation for all costs and delays associated with performing additional tests, obtaining and delivering concrete cores to the Geotechnical Branch, and grouting core holes.

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4.4 Payment

The Department will pay for the completed and accepted quantities under the following. The Pay Unit of “Each” refers to each individual shaft.

Code	Pay Item	Pay Unit
24741EC	Sonar Caliper Testing	Each
21322NC	CSL Testing (6 tubes)	Each
21321NC	CSL Testing (4 tubes)	Each
24742EC	TIP Testing (6 tubes)	Each
24743EC	TIP Testing (4 tubes)	Each

The Department will consider payment as full compensation for all work required under this Section.

SPECIAL NOTE FOR VIBRATION MONITORING

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1.0 GENERAL

Vibration-producing construction activities (primarily pile driving, drilled shaft construction or operation of other heavy construction equipment) will be required during the construction and testing activities related to the Lake Barkley bridge construction. The Contractor is advised that existing bridge structures are located close to the proposed work and that construction activities are to be conducted so as to preclude damage to same. Any damage caused by construction activities on this contract is the responsibility of the Contractor.

1.1 Scope of Work

The scope of work includes furnishing all labor, equipment and analyses associated with surveys of the pre- and post-construction condition of the existing Henry Lawrence bridge piers located adjacent to the new Lake Barkley bridge piers, and performing crack and vibration monitoring during the construction activities as specified in this Special Note.

2.0 PERSONNEL QUALIFICATIONS

Perform the services described below using the services of qualified personnel assigned to this project as described below.

2.1 Pre- and Post-Construction Surveys

Employ a licensed Professional Engineer to conduct pre- and post-construction condition surveys, with at least 4 years of experience in pre- and post-construction condition surveys, and who has conducted a minimum of 4 pre- and post-construction condition survey projects on transportation facilities.

2.2 Vibration Monitoring

Employ a qualified Vibration Instrumentation Engineer (specialist) who is a licensed Professional Engineer, and who has at least 4 years of experience in the installation and use of vibration-monitoring instrumentation and in interpreting instrumentation data for ground vibrations caused by heavy construction, and who has conducted a minimum of 4 vibration monitoring projects for ground vibrations caused by heavy construction. Using this specialist, supervise the Contractor's vibration-monitoring program and establish Safe Vibration Levels for the existing Henry Lawrence Bridge piers for Spans 1 through 4 and End Bent 1.

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3.0 SUBMITTALS AND REPORTS

Make submittals via SharePoint software in accordance with the Project requirements for submittals. See Table 1 below for a list and schedule of required Submittals and Reports. The Department will respond to the Contractor regarding acceptability of Submittals and Reports within 10 business days. A “Business Day” is defined as any day except Saturdays, Sundays and Holidays, as defined in Section 101.03 of the Standard Specifications.

Table 1 – Schedule of Submittals and Reports

Submittal Number	Submittal Item	Calendar Days	Event
1	Proposed licensed Professional Engineer for pre- and post-construction surveys, and proposed vibration specialist. Also include a listing of assigned personnel and their experience and qualifications.	30 After	Notice to Begin Work
2	Vibration Monitoring Plan and Pre-Construction Condition Survey	30 Before	Start of Pile Driving or Drilled Shaft Construction and/or Monitoring
3	Condition Survey and Vibration Monitoring Monthly Status Reports as defined in Sections 5 and 6	30 After and each month until pile driving or drilled shaft construction is complete	Start of Pile Driving or Drilled Shaft Construction and/or Monitoring
4	Vibration Monitoring Summary Report and Post-Construction Condition Survey Report as defined in Sections 5 and 6 of this Special Note.	30 After	Completion of Pile-Driving and/or Drilled Shaft Construction Activities

Provide all submittals and reports in .pdf format

4.0 MONITORING LOCATIONS AND EQUIPMENT

At a minimum, the piers for Spans 1 through 4 and End Bent 1 on the existing Henry Lawrence Bridge will be monitored during pile-driving and drilled shaft construction activities. Provide equipment for monitoring existing cracks and vibration monitoring as outlined in Sections 5 and 6. Establish recommended monitoring locations in the Pre-Construction Condition Survey and Vibration Monitoring Plan.

5.0 CONDITION SURVEYS

Conduct Pre- and Post-Construction Condition Surveys (PCS) on the piers for Spans 1 through 4 and End Bent 1, prior to the commencement, and after the completion, of pile-driving and drilled shaft construction activities. Include documentation of the Piers as viewed from the waterline. Detail (by engineering sketches, video, photographs, and/or notes) any existing structural or cosmetic damage.

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Submit a Pre-Construction Condition Survey report that summarizes the pre-construction condition of the structure(s) and identifies areas of concern, including potential personnel hazards (falling debris) and structural elements that may require support or repair such as, but not limited to, existing visible cracks. Submit a full report in digital form condensed to a pdf file size less than 100 Megabytes. If higher resolution photographs or other records resulting in larger file sizes are required for detail, submit higher resolution versions using a CD or USB-drive media.

Install crack displacement monitoring gages (visual or remote sensing) as appropriate across any significant existing cracks as defined by the Pre-Construction Condition Survey (PCS) engineer to help verify any additional structure distress if it should develop. The appropriate location, number, and type of gages will be established by the Contractor and/or the Department. Read the gages prior to vibration-producing activities, as well as during these activities. Obtain data on a monthly basis for as long as vibration-producing activities are being conducted. Submit a brief monthly report that confirms the data was obtained. Submit a final summary report which summarizes the data obtained on a monthly basis. Alert the Department if any significant movement as defined by the PCS engineer is detected by the monitoring gages.

Conduct a Post-Construction Condition Survey within 10 calendar days after the pile-driving and drilled shaft construction activities for the bridge construction have been completed. The survey will follow the same procedures used for the Pre-Construction Condition Survey. Submit a report using the same format as the Pre-Construction Survey Report.

6.0 VIBRATION CONTROLS

Submit a written Vibration Monitoring Plan to the Engineer, which includes, but is not limited to the following: planned vibration monitoring activities (including the format for reporting the vibration readings), monitoring equipment, anticipated and Safe Vibration Levels (which may be established from a baseline monitoring program) at the closest structures, and communications activities.

During all pile-driving and drilled shaft construction activities, monitor vibration levels at the piers for Spans 1 through 4 and End Bent 1, and establish controls so that Contractor does not exceed the Safe Vibration Level established in the Contractor's Vibration Monitoring Plan to preclude damage to these structures. Collect and store data daily to confirm all equipment is operating within calibration requirements.

Provide vibration monitoring equipment capable of continuously recording the peak particle velocity, recording and transmitting a permanent record of the entire vibration event, transmitting alarms when threshold values are exceeded, and recording / transmitting a time history for alarm exceedance events. Provide vibration monitoring equipment with the following minimum features:

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1. Seismic range: 0.01 to 4 inches per second with an accuracy of +5 percent of the measured peak particle velocity or better at frequencies between 10 Hertz and 100 Hertz, and with a resolution of 0.01 inches per second or less.
2. Frequency response (+3 dB points): 2 to 200 Hertz.
3. Three channels for simultaneous time-domain monitoring of vibration velocities in digital format on three perpendicular axes.
4. Two power sources: internal rechargeable battery and charger and backup power source.
5. Capable of internal, dynamic calibration.
6. Capability to transfer data from memory to permanent digital storage. Instruments must be capable of transmitting vibration data readings to the Contractor within 15 minutes of obtaining the readings. Provide computer software to perform analysis and produce reports of continuous monitoring.
7. Continuous monitoring mode must be capable of recording single-component peak particle velocities, and frequency of peaks with an interval of one minute or less.

Submit a monthly report that confirms vibration monitors are working and contains the highest vibration level peak particle velocities (PPV) and frequency observed at each monitoring location, starting after the first vibration monitor is installed, and continuing until vibration monitoring is terminated.

Submit a final report which summarizes the data collected. Include copies of all vibration records and associated construction activity (pile driving) data in the final report, submitted to the Engineer, in a format approved by the Engineer, within 14 calendar days of completing vibration monitoring. Submit a full report in digital form condensed to a pdf file size less than 100 Megabytes. If higher resolution photographs or other records resulting in larger file sizes are required for detail, submit higher resolution versions using a CD or USB-drive media.

Interpret the data collected, including making correlations between seismograph data and specific pile-driving and drilled shaft construction activities. Evaluate the data to determine whether the measured vibrations can be reasonably attributed to construction activities. Include these evaluations in the final report.

Use a Threshold Value of 0.4 inches per second and a Limiting Value of 0.5 inches per second for vibration Response Values, unless otherwise provided for in the Vibration Monitoring Plan. The actions associated with these Response Values are defined below. Plans for such actions are referred to herein as plans of action, and actual actions to be implemented are referred to herein as response actions. Response Values are subject to adjustment by the Engineer as indicated by prevailing conditions or circumstances.

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If a Threshold Value is reached, take the following actions:

1. Immediately notify the Engineer.
2. Meet with the Engineer to discuss the need for response action(s).
3. If directed by the Engineer during the above meeting that a response action is needed, submit within 24 hours a detailed specific plan of action based as appropriate on the generalized plan of action submitted previously as part of the vibration-monitoring plan specified in Section 3.
4. If directed by the Engineer, implement response action(s) within 24 hours of submitting a detailed specific plan of action, so that the Limiting Value is not exceeded.

If a Limiting Value is reached, take the following actions:

1. Immediately notify the Engineer and suspend activities in the affected area, with the exception of those actions necessary to avoid exceeding the Limiting Value.
2. Meet with the Engineer to discuss the need for response action(s).
3. If directed by the Engineer during the above meeting that a response action is needed, submit within 24 hours a detailed specific plan of action based as appropriate on the generalized plan of action submitted previously as part of the vibration-monitoring plan specified in Article 2.
4. If directed by the Engineer, implement response action(s) within 24 hours of submitting a detailed specific plan of action, so that the Limiting Value is not exceeded.

7. COMMUNICATIONS

Maintain a log of any complaints and make this available to the Engineer on request. Notify the Department at least 2 weeks prior to commencement of any vibration-producing activity that might affect the structure.

8. MEASUREMENT

Payment for Vibration Monitoring is for all work described in this special note including but not necessarily limited to surveys, instrumentation, monitoring, and reports.

9. PAY ITEMS

Payment will be made under:

BID ITEM CODE	ITEM	UNIT
24550EC	VIBRATION MONITORING	LS

SPECIAL NOTE FOR STEEL ERECTION - ARCH SPAN

1.0 DESCRIPTION. This work shall consist of fabricating, furnishing and installing the arch span superstructure, including tied arch rib, tie girder, knuckle, hanger attachments, floor beams, stringers and bracing. (Note: This work does not cover fabrication and installation of the arch hanger system, which is covered under Special Note for Bridge Strand Hangers.)

Materials and workmanship shall be in accordance with the KYTC Standard Specifications for Road and Bridge Construction, 2012 Edition (KYTC); AASHTO/ AWS D1.5M/D1.5 "Bridge Welding Code"; AWS D1.1/D1.1M "Structural Welding Code – Steel"; the Contract Drawings; and this Special Note.

Where a conflict exists between this Special Note and KYTC Section 607, the provisions herein shall govern.

2.0 MATERIALS. Materials shall conform to the Contract Drawings and KYTC Section 607.

3.0 ERECTION ANALYSIS AND STABILITY.

3.1 Steel Erection Responsibility. The stability of the structure during erection, and the final geometry of the structure, is the responsibility of the Contractor. The Contractor shall retain an erection engineer for the purpose of evaluating the stability, state of stress and geometry of the structure during and after erection. The contractor should retain a wind specialist to evaluate wind loads during construction which are appropriate for the proposed erection scheme chosen. The Contractor shall erect the bridge in a safe manner without overstressing the structural components during erection and shall leave the structure in a state of stress compatible with the design.

Structural steel shall be in conformance with KYTC Section 607. Steel erection shall be in conformance with the AASHTO/NSBA "Steel Bridge Erection Guide Specification," S10.1-2007.

3.2 Conceptual Erection Sequence. The assumed erection sequence, as described in the General Note "Arch Erection and Camber" in the Contract Drawings, is that the arch rib, tie, bracing and floor system is constructed on blocking in the "no-load condition" with four bearing support points. The blocking is assumed to be removed only after the superstructure steel is completely erected. This would require floating in of the completed steel superstructure for placement on top of Piers 4 and 5. The Contractor may choose and develop any sequence that can safely erect the bridge without overstress or damage to the structural steel. The design of any necessary shoring / falsework and its foundations is the responsibility of the contractor.

3.3 Arch Erection and Camber. In addition to full analysis of the completed structure, load capacity and stability of the main span arch structure has been verified by the Engineer of Record for the completely erected steel superstructure, prior to deck placement. The General Note "Arch Erection and Camber" details the assumed erection

and deck pour sequence that is consistent with the camber diagrams shown on the Contract Drawings and the load capacity of the fully-erected structure. No provision in either the camber or structural capacity of the members has been included for erection stresses.

The load capacity and stability verification of a partially completed arch span in the various stages of erection prior to installation of all steel members is the responsibility of the Contractor. The Contractor shall evaluate the partially completed structure in accordance with the same design provisions used for the permanent structure except as indicated herein. Wind loads for the final structure are given on the Contract Drawings and are based on a project specific wind study and wind tunnel testing performed by RWDI and corresponds to a mean hourly wind speed of 69.6 mph at deck level. During construction, wind loads are predicted to correspond to a 10-year mean hourly velocity of 60.5 mph at the deck level. The RWDI report did not evaluate any construction stage configuration of the arch. The contractor should retain a wind specialist to evaluate wind loads during construction which are appropriate for the proposed erection scheme chosen.

No uplift at bearings shall be allowed in any construction phase.

3.4 Changes to the Structure. Any changes to the structural steel system shown in the Contract Plans require reanalysis for load capacity and stability for both construction and permanent load conditions, including seismic. Diaphragm action of the stay-in-place forms shall be neglected in all analyses.

Dead load deflection, camber and stringer haunch thickness are based on the erection and slab pouring sequences as described in the General Note "Arch Erection and Camber" and as shown in the plans. Any deviation from this sequence will need to be evaluated by the Contractor's engineer to determine the effect on camber, dead load deflection and structural member stresses. This evaluation must be submitted to the Engineer for review and approval by the Engineer of Record.

4.0 QUALIFICATIONS AND SUBMITTALS.

4.1 Erector Qualifications. Structural steel shall be erected by a qualified, competent erection contractor. To establish qualification the erection contractor shall submit to the Department proof of their experience on previous projects of equivalent complexity which, at a minimum, include the following:

- A) Any one lift using two or more cranes/derricks/poles,
- B) Steel spans over water or active railroad/rapid transit tracks,
- C) Erection with floating equipment,
- D) Field splicing primary members while held in place by erection equipment

The Department shall determine whether the submitted evidence is satisfactory to establish qualification and competency.

4.2 Erection Procedure.

General. The Contractor shall submit a detailed erection procedure to the Engineer for each bridge structural unit, prepared and sealed by a professional engineer licensed in Kentucky. The professional engineer who prepares the erection procedure and calculations shall have experience in steel erection of similar size, complexity, and scope. The procedure shall address all requirements for erection of the structural steel into the final designed configuration and satisfy all written comments from the Engineer of Record and the Department or its agents prior to the start of erection. The procedure, as a minimum, shall include the following information:

Drawings.

- A) Plan of the work area showing permanent support structures (piers and abutments), roads, waterways (including navigational channel), overhead and underground utilities, and other information pertinent to erection.
- B) Erection sequence for all members noting any temporary support conditions, such as holding crane positions, temporary supports, falsework, etc. Member reference marks, when reflected on the erection plans, should be the same as used on shop detail drawings.
- C) Primary member delivery location and orientation.
- D) Location of each crane for each primary member pick, showing radius and crane support (barges, mats, etc.).
- E) Capacity chart for each crane configuration and boom length used in the work.
- F) Center of gravity locations for primary members.
- G) Detail, weight, capacity, and arrangement of all rigging for primary member picks.
- H) Lifting weight of primary member picks, including all rigging and pre-attached elements.
- I) Details of any temporary lifting devices to be bolted or welded to permanent members, including: method and place (shop or field) of attachment; capacity; and method, time and crew responsible for removal.
- J) Bolted splice assembly requirements.
- K) Lifting/handling procedure for any primary member that has a lifted length-to-width ratio (l/b) greater than 85.
- L) Blocking details for bridge bearings.

Calculations.

- A) Design calculations indicating the load capacity and verifying the stability of temporary supports for structure and crane(s) for each pick and release.
- B) Calculations to substantiate structural adequacy and stability of all steel members for each step of bridge assembly, including documentation of the wind loads and other construction loads assumed to be applied.
- C) Calculations to verify adequate capacity of contractor-fabricated rigging such as lift beams, welded lugs, spreader beams, beam clamps, etc. Submit manufacturers' certification or catalog cuts for pre-engineered devices.
- D) Geometrical information that will be used to monitor the structure during erection to ensure that the final geometry of the structure is as indicated on the plans.

Coordination Items.

- Review / approval by other agencies as required (e.g., US Coast Guard, US Army Corp of Engineers, etc.).
- Conform to Special Note for Helper Boat to minimize impacts to commercial towing industry.
- Construction activities that occur concurrently with steel erection, such as setting forms or concrete deck pours.

4.3 Shop Drawings. Shop drawings for arch system and components shall conform to KYTC Section 607 and Special Provision for Shop Drawings & Welding Procedures.

5.0 TRANSPORTATION, HANDLING AND SUPPORT.

5.1 Transportation.

Responsibility. The Contractor is responsible for coordinating delivery from the fabricator to the jobsite and for providing adequate site access.

Shipping plan. The Contractor is responsible for preparing a shipping plan indicating support, lateral bracing, and tie-down points for primary members during transportation to the jobsite.

Handling. Ship primary members upright, unless otherwise approved by the Department. Load, support, and unload primary members in a manner that will not damage, excessively stress or permanently deform the steel or cause repeated stress reversals in the members.

5.2 Lifting and Assembly.

General. Lift, position and assemble all members in accordance with the approved erection procedures. The proposed crane location(s) and member delivery location(s) may require modification in the field to suit changing jobsite conditions. However, cranes and material must be located such that the lift is safe and within the crane manufacturer's rated capacity for all required positions.

Lifting devices. Install lifting devices, including bolted assemblies using existing bolt holes (splices, cross frame connection plates, etc.), using Department-approved details. Welded lugs are not permitted without approval of the Engineer.

Erection stability. All structural members shall be stabilized with falsework, temporary bracing and/or holding cranes until the structure is complete and has the necessary lateral stability to make the structure self-supporting.

Falsework and temporary supports. Falsework and temporary supports shall be detailed to ensure that the temporary elevation of supported steel accommodates the deflections expected to occur as the structure is completed.

Pins. Pins are normally used to align holes for bolted field connections. Field reaming to facilitate fit-up will only be allowed with the Department's prior approval. Any abnormal distortion of the member or of the holes during the alignment process shall be immediately reported to the Engineer.

Connections. For splice connections of primary members, fill at least 50 percent of the holes prior to crane release. The 50 percent may be either erection bolts in a snug tight condition or full-size erection pins. At least half (25 percent of all holes) shall be filled with bolts, and sufficient pins shall be used near outside corners of splice plates and at member ends near splice plate edges to ensure alignment. Uniformly distribute the filled holes.

The 50 percent requirement may be waived if a reduced percentage is calculated as sufficient and shown on the approved erection procedure. Permanent bolts may be used as erection bolts, provided they are installed in accordance with the specifications.

Primary member splice connections that are assembled on the ground (prior to erection) shall be 100 percent complete, in the no-load condition, prior to any lifting operation.

Abnormalities. Any abnormal member deformation or brace deflection after crane release or temporary support removal shall be immediately reported to the Engineer for swift resolution. Further work affecting the area, except for restoring support or adding bracing, shall be stopped until the deformation/deflection is resolved.

6.0 REPAIR.

6.1 Documentation. The Contractor is responsible for documenting damage due to handling, removal of erection aids, aligning members and other actions, uncorrected misfits at connections, and misalignments exceeding tolerances in erected members. As-received damage attributable to transport or fabrication shall also be documented.

6.2 Implementation. The Contractor shall propose a method of repair and basis for acceptance for the Department's review.

6.3 Repair Procedures. Submit repair procedures for damaged or misaligned steel in the form of sketches and/or written procedures as applicable and as requested by the Department. Information must provide sufficient detail for the Department to adequately review the repair application. After repairs are complete, the Contractor shall provide as-built detailed drawings, NDT results, and procedures/materials used to the Engineer for inclusion in the project file.

6.4 Welds. Field or shop welds that are unacceptable must be repaired in accordance with AWS D1.5. Responsibility for the cost of the repair and subsequent inspection shall be at the Contractor’s expense.

7.0 MEASUREMENT. The cost of fabricating, furnishing and installing the arch span superstructure, including tied arch rib, tie girder, knuckle, hanger attachments, floor beams, stringers, bracing, and LCE isolation bearing masonry plates and masonry plate studs; and all material, labor, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents; shall be included in the lump sum unit price for Structural Steel – Arch Span.

(Note: The cost for fabricating and installing the arch hanger system is separate from this pay item and is covered in Special Note for Bridge Strand Hangers.)

8.0 PAYMENT.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
08160	STRUCTURAL STEEL – ARCH SPAN	LS

SPECIAL NOTE FOR STEEL ERECTION – APPROACH SPANS

1.0 STEEL ERECTION RESPONSIBILITY

The stability of the structure during erection, and the final geometry of the structure, is the responsibility of the contractor. The contractor shall retain an erection engineer for the purpose of evaluating the stability, state of stress and geometry of the structure during and after erection. The contractor shall erect the bridge in a safe manner without over stressing the structural components during erection and shall leave the structure in a state of stress compatible with the design.

Structural steel shall be in conformance with Section 607 of Kentucky Transportation Cabinet's standard specifications for road and bridge construction. Steel erection shall be in general conformance with the AASHTO/NSBA steel bridge erection guide specification, S10.1-2007.

2.0 CONSTRUCTION LOADING

Load capacity and stability of the steel girders has been verified only for the completely erected steel superstructure, prior to deck placement. Load capacity in the fully-erected state has been checked using AASHTO LRFD bridge design specifications, section 3.4.2 with a load factor of 1.25 for dead loads and for wind. A construction phase horizontal wind pressure of 50 psf, representing the mean-hourly wind speed with a 10-year return period has been used. Allowable lateral deflection under construction wind loading is $\ell/150$ (span/150).

The load capacity and stability verification of partially completed girders in the various stages of erection prior to installation of all girders, crossframes, and lateral bracing is the responsibility of the contractor. A minimum construction horizontal wind pressure of 50 psf shall be used in the design of temporary shoring / falsework and for checking partially erected girders.

Girders and their bearing stiffeners should be vertical under full dead load. Uplift at bearings shall be prevented in each construction phase.

3.0 CHANGES TO THE STRUCTURE

Any changes to the structural steel system shown in the contract plans requires reanalysis for load capacity and stability for both construction and permanent load conditions. Diaphragm action of the stay-in-place forms shall be neglected in all analyses.

Dead load deflection, girder haunch thickness, and verified construction stresses are based on the slab pouring sequence shown in plans. Any deviation from the plan slab pouring sequence will need to be evaluated by the engineer of record to determine the effect on haunch, dead load deflection, and girder stress.

4.0 CONCEPTUAL ERECTION SEQUENCE

The need for and location of falsework has been estimated for one conceptual erection sequence. The contractor may choose and develop any sequence that can safely erect the bridge without overstress or damage to the structural steel. The design of any needed shoring / falsework and their foundations is the responsibility of the contractor.

5.0 ERECTOR QUALIFICATIONS

Structural steel shall be erected by a qualified, competent erection contractor. To establish qualification, the erection contractor shall submit to the owner documented previous, equivalently complex erection projects which, at a minimum, include the following:

- A. Any one lift using two or more cranes/derricks/poles,
- B. Spans over water or active railroad/rapid transit tracks,
- C. Erection with floating equipment,
- D. Field splicing primary members while held in place by erection equipment

The owner shall determine whether the submitted evidence is satisfactory to establish qualification and competency.

6.0 ERECTION PROCEDURE

- 6.1 GENERAL: The contractor shall submit a detailed erection procedure to the owner for each bridge structural unit, prepared and sealed by a professional engineer licensed in the Commonwealth of Kentucky. The professional engineer who prepares the erection procedure and calculations shall have experience in steel erection of similar size, complexity, and scope. The procedure shall address all requirements for erection of the structural steel into the final designed configuration and satisfy all written owner comments prior to the start of erection. The procedure, as a minimum, shall include the following information:

- A. DRAWINGS:
 - i. Plan of the work area showing permanent support structures (piers and abutments), roads, waterways (including navigational channel), overhead and underground utilities, and other information pertinent to erection
 - ii. Erection sequence for all members noting any temporary support conditions, such as holding crane positions, temporary supports, falsework, etc. Member reference marks, when reflected on the erection plan, should be the same as used on shop detail drawings

- iii. Primary member delivery location and orientation
- iv. Location of each crane for each primary member pick, showing radius and crane support (barges, mats, etc.)
- v. Capacity chart for each crane configuration and boom length used in the work
- vi. Center of gravity locations for primary members
- vii. Detail, weight, capacity, and arrangement of all rigging for primary member picks
- viii. Lifting weight of primary member picks, including all rigging and pre-attached elements
- ix. Details of any temporary lifting devices to be bolted or welded to permanent members, including method and time (shop or field) of attachment, capacity, and method, time and responsibility for removal.
- x. Bolted splice assembly requirements
- xi. Lifting/handling procedure for any primary member that has a lifted length divided by width (l / b) greater than 85
- xii. Blocking details for bridge bearings

B. CALCULATIONS:

- i. Design calculations indicating the load capacity and verifying the stability of temporary supports for structure and crane(s) for each pick and release
- ii. Calculations to substantiate structural adequacy and stability of girders for each step of bridge assembly
- iii. Calculations to verify adequate capacity of contractor-fabricated rigging such as lift beams, welded lugs, spreader beams, beam clamps, etc. Submit manufacturers' certification or catalog cuts for pre-engineered devices
- iv. Geometrical information that will be used to monitor the structure during erection to ensure that the final geometry of the structure is as indicated on the plans

C. COORDINATION ITEMS

- i. Review / approval by other agencies as required (e.g., us coast guard, us army corps of engineers, etc.)
- ii. Construction activities that occur concurrently with steel erection, such as setting forms or concrete deck pours

7.0 TRANSPORTATION

- 7.1 **RESPONSIBILITY:** The contractor is responsible for coordinating delivery from the fabricator to the jobsite and for providing adequate site access.
- 7.2 **SHIPPING PLAN:** The contractor is responsible for preparing a shipping plan indicating support, lateral bracing, and tie-down points for primary members during transportation to the jobsite.
- 7.3 **HANDLING:** Ship primary members upright, unless otherwise approved by the owner. Load, support, and unload primary members in a manner that will not damage, excessively stress, or permanently deform the steel and not cause repeated stress reversals.

8.0 LIFTING AND ASSEMBLY

- 8.1 **GENERAL:** Lift, position, and assemble all members in accordance with the approved erection procedures. The proposed crane location(s) and member delivery location(s) may require modification in the field to suit changing jobsite conditions. However, cranes and material must be located such that the lift is safe and within the crane manufacturer's rated capacity for all required positions.
- 8.2 **LIFTING DEVICES:** Install lifting devices, including welded lugs and bolted assemblies using existing bolt holes (splices, cross frame connection plates, etc.), and use owner approved details.
- 8.3 **ERECTION STABILITY:** Girders shall be stabilized with falsework, temporary bracing, and/or holding cranes until a sufficient number of adjacent girders are erected with cross frames connected to provide the necessary lateral stability and to make the structure self-supporting.
- 8.4 **FALSEWORK AND TEMPORARY SUPPORTS:** Falsework and temporary supports shall be detailed to ensure that the temporary elevation of supported steel accommodates the deflections expected to occur as the structure is completed.
- 8.5 **PINS:** Pins are normally used to align holes for bolted field connections. Field reaming to facilitate fitup will only be allowed with the owner's prior approval. Any abnormal distortion of the member or of the holes during the alignment process shall be immediately reported to the owner.

- 8.6 CONNECTIONS: For splice connections of primary members, fill at least 50 percent of the holes prior to crane release. The 50 percent may be either erection bolts in a snug tight condition or full-size erection pins, but at least half (25 percent of all holes) shall be bolts, and sufficient pins shall be used near outside corners of splice plates and at member ends near splice plate edges to ensure alignment. Uniformly distribute the filled holes.

The 50 percent requirement may be waived if a reduced percentage is calculated as sufficient and shown on the approved erection procedure. Permanent bolts may be used as erection bolts, provided they are installed in accordance with the specifications.

Primary member splice connections that are made up on the ground (prior to erection) shall be 100 percent complete, in the no-load condition, prior to any lifting operation.

- 8.7 ABNORMALITIES: Any abnormal member deformation or brace deflection after crane release or temporary support removal shall be immediately reported to the owner for swift resolution. Further work affecting the area, except for restoring support or adding bracing, shall be stopped until the deformation/deflection is resolved.

9.0 REPAIR

- 9.1 DOCUMENTATION: The contractor is responsible for documenting damage due to handling, removal of erection aids, aligning members and other actions, uncorrected misfits at connections, and misalignments exceeding tolerances in erected members. As-received damage attributable to transport or fabrication shall also be documented.
- 9.2 IMPLEMENTATION: The contractor shall propose a method of repair and basis for acceptance for the owner's review.
- 9.3 REPAIR PROCEDURES: Submit repair procedures for damaged or misaligned steel in the form of sketches and/or written procedures as applicable. Information must provide sufficient detail for the owner to adequately review the repair application. After repairs are complete, the contractor shall provide as-built detailed drawings, NDT results, and procedures/materials used to the owner for inclusion in the project file.
- 9.4 WELDS: Field or shop welds that are unacceptable must be repaired in accordance with d1.5. Responsibility for the cost of the repair and subsequent inspection shall be based on the cause.

SPECIAL NOTE FOR STAINLESS STEEL REINFORCEMENT

1.0 DESCRIPTION. The Contractor shall use stainless steel reinforcement bars in the concrete deck slab, curb, and sidewalk, at locations as indicated in the plans. Reinforcement bars shown in the Plans marked with the suffix "SS" shall be stainless steel as described herein.

The work shall be performed in accordance with the applicable requirements of Sections 602 and 811 of the Standard Specifications.

2.0 MATERIALS.

Grade and Type: The Contractor shall supply test results certifying that the materials conform to Grade 60 or 75 deformed reinforcement bars per ASTM A955, including the annex, and that they conform to one of the following UNS designations; S24100, S32205, S32304, S20910, S30400, S31603, S31653, S32101, S32201, or S31803.

All bars shall be of the same UNS designation.

Chemical Composition: Material shall conform to that specified in ASTM A276, Table 1, Chemical Requirements.

Heat Treatment: Bars may be furnished in accordance with one of the heat treatment conditions listed in ASTM A955, as necessary to meet the requirements of this specification.

Finish: Bars are to be supplied free of dirt, mill scale, oil, and debris by pickling. Bars shall be fabricated and bent using equipment that has been thoroughly cleaned or otherwise modified to prohibit contamination of the stainless steel from fragments of carbon steel or other contaminants.

Reinforcing bars displaying rust/oxidation, questionable blemishes, or that deviate from round shall be subject to rejection.

Bending: Bending shall be performed in accordance with Section 602 of the Standard Specifications and ASTM A955.

Manufacturers: Manufacturers shall be selected from "Reinforcing Steel Manufacturers" listed in KYTC's "List of Approved Materials":

(<http://transportation.ky.gov/materials/pages/List-Of-Approved-Materials.aspx>).

The Contractor is responsible for ensuring that all materials supplied meet the Contract requirements.

Fabricators: Fabricators shall be selected from "Reinforcing Steel Fabricators" listed in KYTC's "List of Approved Materials":

(<http://transportation.ky.gov/materials/pages/List-Of-Approved-Materials.aspx>).

Control of Material: Samples for testing shall be supplied to the KYTC Materials Laboratory for testing, generally following applicable provisions of KM-101. One sample per heat per bar size shall be supplied. Each sample shall consist of two five-foot-long specimens.

Mill Test Reports: Reports shall be provided for the Project and shall:

1. Be from the supplying mill verifying that the stainless reinforcement provided has been sampled and tested and the test results meet the Contract requirements;
2. Include a copy of the chemical analysis of the steel provided, with the UNS designation, the heat lot identification and the source of the metal if obtained as ingots from another mill;
3. Include a copy of tensile strength, yield strength and elongation tests on each of the sizes of stainless steel reinforcement provided.
4. Permit positive determination that the reinforcement provided is that which the test results cover.
5. Include a statement certifying that the materials are being melted and manufactured in the United States.

3.0 CONSTRUCTION.

Methods: Construction methods shall conform to Section 602 of the Standard Specifications except as modified below:

Ship, handle, store, and place the stainless steel reinforcement bars according to the applicable provisions with the following additions and exceptions:

1. Prior to shipping ensure that all chains and steel bands will not come into direct contact with the stainless steel reinforcement bars. Place wood or other soft materials (i.e., thick cardboard) under the tie-downs. Alternatively, use nylon or polypropylene straps to secure the stainless steel reinforcement bars.
2. When bundles of reinforcement steel and stainless steel reinforcement bars must be shipped one on top of the other, the stainless steel reinforcement bars should be loaded on top. Use wooden spacers to separate the two materials.
3. Outside storage of stainless steel reinforcement bars is acceptable. Cover the stainless steel reinforcement bars with tarpaulins.
4. Store stainless steel reinforcement bars off the ground or shop floor on wooden supports.
5. Do not use carbon steel tools, chains, slings, etc. when fabricating or handling stainless steel reinforcement bars. Only use nylon or polypropylene slings.

6. Place all stainless steel reinforcement on bar chairs that are solid plastic, stainless steel, or epoxy-coated steel. Fabricate stainless steel metal chairs and continuous metal stainless steel supports from stainless steel conforming to the requirements of ASTM A493, Type 316, UNS number S31600; or Type 316L, UNS number S31603. Stainless steel chairs used above steel beams shall have plastic coated feet.
7. Tie wire used to tie stainless steel reinforcement shall be 16 gauge wire fabricated from stainless steel alloy Type 316L, UNS designation S31603, dead soft annealed, annealed at size.
8. Do not tie stainless steel to uncoated or coated reinforcement, or to galvanized attachments or galvanized conduits. Direct contact is not acceptable. When stainless steel reinforcing bars or dowels are adjacent to coated or uncoated reinforcing bars or galvanized metals, maintain a minimum 1 inch clearance between the two metals. Where insufficient space exists to maintain this minimum, the bar may be sleeved with a continuous 1/8" minimum thickness polyethylene or nylon tube bound with nylon or polypropylene cable ties and extending at least 1 inch in each direction past the point of closest contact between the two dissimilar bars.
9. Uncoated fasteners, anchors, lifting loops, etc., that extend from the top flange of prestressed beams into the bridge deck shall be completely removed or cut off flush with the top flange of the beam prior to casting the deck.
10. To prevent corrosion from dissimilar metals, when stainless steel reinforcement is used in abutments, end diaphragms, concrete barriers, etc., only epoxy-coated or non-metallic snap ties, straps, or other forming hardware shall be permitted.

Notification: The Contractor shall notify the Engineer a minimum of 2 weeks prior to placing the stainless steel reinforcement.

Splices: Splices shall generally be of the lap type.

Approval: Stainless steel reinforcement placed in any member must be inspected and approved by the Engineer before placing concrete. Concrete placed in violation of this specification may be rejected and removal required.

4.0 MEASUREMENT. Measurement will be in pounds of steel placed in the structure as shown on the plans, at the contract unit price.

5.0 PAYMENT. "STEEL REINFORCEMENT STAINLESS STEEL" will be paid for at the contract price per pound and shall be compensation in full for all costs of fabricating, shipping, furnishing and installing the reinforcement and all component materials as specified in this Special Note and in the Contract Plans.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24112EC	STEEL REINFORCEMENT STAINLESS STEEL	LB

SPECIAL NOTE FOR BRIDGE STRAND HANGERS

1.0 DESCRIPTION. This work shall consist of the manufacturing, testing, fabricating, transporting, and installation of arch hangers, sockets and spacers for tied arch bridges. Materials and workmanship shall be in accordance with the KYTC Standard Specifications (KYTC); AASHTO/ AWS D1.5M/D1.5 “Bridge Welding Code”; AWS D1.1/D1.1M “Structural Welding Code – Steel”; AASHTO “LRFD Bridge Design Specifications”, 6th Edition (AASHTO LRFD Design); AASHTO “LRFD Bridge Construction Specifications,” 3rd Edition, 2010 (AASHTO LRFD Construction); the Contract Documents; and this Special Note.

2.0 MATERIALS. Materials shall conform to the following:

A. Strand. Hangers shall consist of galvanized steel wire structural strand composed of zinc-covered wires to make up the finished diameter. The structural strand for the bridge hangers shall meet the requirements of ASTM A586, “*Standard Specification for Zinc-Coated Parallel and Helical Steel Wire Structural Strand*,” with Class A coating inner wires and Class C coating outer wires. Strand shall be pre-stretched as required in this special provision.

The design of the strands for the structure and the structure’s fabricated geometry shall be based on the appropriate Modulus of Elasticity for the material being used.

B. Sockets. Sockets shall be forged or cast steel. Forged sockets shall meet the requirements of ASTM A668, “*Standard Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use*”, Class C, and shall be annealed. Cast sockets shall be fully annealed high strength castings conforming to ASTM A148, “*Standard Specification for Steel Castings, High Strength, for Structural Purposes*”, Grade 90/60. All sockets shall be galvanized in accordance with ASTM A123, “*Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products*.” Sockets shall be of sufficient strength to produce a failure in the strand material, rather than a failure of the socket itself.

C. Pins. Socket pins shall satisfy ASTM A668 Class F requirements. Furnish pins conforming to KYTC Subsection 607.03.09 Pins and Rollers, except provide an ANSI 250 finish.

D. Zinc. Slab zinc for socket to strand attachment shall meet the requirements of ASTM B6, “*Standard Specification for Zinc*,” high grade or better.

E. Spacers. All materials for hanger spacers shall be new. No reclaimed elastomeric materials shall be incorporated in the fabrication of the spacers. The elastomeric materials specified for the hanger spacers shall be either 100 percent virgin Neoprene (polychloroprene), or natural rubber (polyisoprene) and shall conform to Section 18.2 of the AASHTO LRFD *Bridge Construction Specifications, 3rd Edition, 2010*. The nominal hardness of the elastomeric element(s) shall not exceed 60 on the Shore A scale.

Laminates shall be rolled mild steel sheets meeting the requirements of ASTM

A709, Grade 36. Structural steel for manufacture of the hanger spacers shall meet the requirements of ASTM A709, Grade 36 and shall be galvanized in accordance with ASTM A123. All galvanizing shall be done prior to any required bonding of steel to rubber. Surfaces of steel to be bonded to rubber shall not be galvanized.

F. Wire Rope Lubricant. Bridge strand shall be treated with PreLube 19 Preservative Lubricant by Grignard, Inc., applied in accordance with manufacturer's recommendations.

3.0 DESIGN. Design shall be in accordance with the Contract Documents, this special provision and other specifications referenced herein.

4.0 FABRICATION. Hanger geometry shall be as defined in the Contract Plans.

Wires used in each hanger shall be made in one continuous piece. The splicing of wire is not permitted. Strand shall be of long lay, but shall not be of such length to prevent keeping the center in its true position during any of the operations before the hangers are in their final positions.

Before commencing with the manufacture of the strands, the Contractor shall be assured by preliminary tests that the proposed material will meet the specifications with regard to strength and elasticity. Once the manufacture of the strand has begun, no changes shall be made or allowed as to the grade of wire, the construction or lay, or other factors which would affect the uniformity of the product.

Each length of strand as fabricated shall be prestressed under a load equal to 55 percent of its specified ultimate (breaking) strength in straight tension. The prestressing shall be done in an approved manner that will remove all of the structural stretch that may occur under the load which the hangers are designed to carry.

After prestressing, the strand shall be measured for the various hanger lengths while under a known tension equal to the dead load stress shown on the plans, using calibrated steel tapes. After marking for length the load shall be released and then reapplied. A second measurement shall then be made and the two measurements shall check within a tolerance of 0.25 inches.

At the time the strand is measured, the Contractor shall mark the centerline between sockets and shall place marks using paint or other approved method on the outside surface of the strand at sufficiently close intervals for use as a guide to eliminate any change in length of the hangers due to twisting.

The strand shall then be cut and the sockets shall be put on carefully to ensure socket and strand alignment. The sockets shall be attached to the strands by using zinc as specified in ASTM B6, and using a reliable method that will not permit the strand, when stressed to 100 percent of its specified ultimate strength under the test specified hereafter, to slip more than 0.5 inches. If a greater movement should occur, the method of attachment shall be changed until a satisfactory one is found. Each end fitting of the finished assembly shall be proof-loaded to a minimum of 50 percent of the ultimate strength of the strand.

The laminated components of the spacers shall be individually molded to the required size. Completed units shall be packaged and crated in such a manner that they will not become damaged while being handled, transported or stored. Any unit, upon inspection by the Engineer or KYTC, deemed to be damaged in any way will be replaced by the Contractor at his expense.

5.0 SAMPLING, TESTING & INSPECTION.

A. Sockets. Sockets shall be subjected to Charpy impact tests in accordance with ASTM A781, "*Standard Specification for Castings, Steel and Alloy, Common Requirements, for General Industrial Use*," S9 (absorbed energy) shall be made on each heat. If Charpy V-notch test values are less than 15 ft-lb at 55 degrees F for any heat, all sockets represented by that heat will be rejected.

All sockets shall be given a visual inspection and evaluated for defects in accordance with the Manufacturers Standardization Society of Valve and Fitting Industry's *Quality Standard for Steel Castings for Valves, Flanges and Fittings and other Piping Components - Visual Method for Evaluation of Surface Irregularities*, SP-55, latest edition. Visual Inspection as required above shall be performed by an independent commercial testing laboratory approved by the Engineer as being qualified to perform such work. If visual examination reveals any defect, nondestructive tests as deemed appropriate by the Engineer for the type of defect observed, shall be required. Non-destructive tests shall be performed by the same approved laboratory, in accordance with the appropriate Supplementary Requirements of ASTM A781. The Engineer, with KYTC concurrence, will determine the acceptability of sockets evaluated in accordance with this standard.

Should a socket be unacceptable, that socket shall be replaced, or alternatively, the Contractor may propose the use of other non-destructive test methods to establish the acceptability and/or reparability of the socket. These test methods, done at the expense of the Contractor, may include, for example, radiography, ultrasonic, magnetic particle or dye penetrant. For those sockets that are repaired, follow-up non-destructive tests, at the Contractor's expense, shall be performed to verify the success of the repair procedure. The Engineer shall determine the acceptability and/or reparability of a socket based on the results of the tests conducted. The Engineer shall be the sole judge as to the suitability of a repaired casting.

B. Strength & Modulus of Elasticity. After prestressing, the modulus of elasticity of each strand shall be determined, and it shall be submitted to the Engineer and KYTC. The modulus of elasticity shall be determined from a gauge length of no less than 100 inches and shall be computed on the gross metallic area of each strand size. A stress-strain curve shall be plotted from the test results of each strand size, and from these curves, the modulus of elasticity shall be computed. The elongation readings used for computing the modulus of elasticity shall be taken when the strand is stressed to not less than 10 percent of the listed strength nor more than 90 percent of the prestressing load. The stretch in any strand during the above increment of load shall not vary more than 6 percent from the average stretch of all strand tested. Preliminary to the testing of the strand specimens, the specimen shall be stressed in the testing machine to an accurately measured load equal to the prestressing load, following which the load shall be released and the test commenced. The preliminary stressing procedure shall be uniform for all specimens. Tests for modulus of elasticity of the strand may be made at the time that the test pieces are tested for strength.

From each prestressed length of strand, one piece shall be cut, after prestressing,

of sufficient length to make a test for strength and elasticity on a single straight strand. The ends of the test pieces shall be socketed with sockets of the same design as those proposed for use in the construction. The strands, in single part tests, shall develop a minimum ultimate strength equal to the value stipulated in the applicable ASTM specification for the material being used and for the size of strand or rope specified. If, after six or more tests of straight strand of each size have been made, the Engineer and KYTC find that the strength and elasticity have sufficient uniformity, one test on a straight strand of each size may be made thereafter from each manufactured length of strand of each size, instead of one from each prestressed length. The strand shall show a well-defined and uniform elastic stretch and recovery after prestressing.

C. Hanger Assemblies. The Contractor shall prepare at least two (2) specimens of hanger of each strand size, at least 25 diameters long, with sockets (selected at random from those prepared for use) attached to each end, and these specimens shall be stressed to destruction. Under this test, the specimens shall develop the ultimate strength. Material and method of socketing shall be the same for both the tests and the actual hanger strand. The sockets in every instance shall be of sufficient strength to produce failure in the strand material. Sockets used for the tests may not be reused in the actual construction.

If an assembly should fail in the anchorage of the strand in the socket, or if a socket should break or otherwise fail at less than the specified ultimate load during the tests, six (6) additional assemblies shall be fabricated and the tests repeated. If one or more sockets fail during additional tests, the entire lot shall be rejected and new sockets furnished and tested.

Certified test reports covering all the tests specified shall be furnished to the Engineer and KYTC. No claims for delay will be considered for testing or failure to submit required testing documentation in a timely manner.

Shop Inspection. The Engineer reserves the right to visit the manufacturer's fabrication shop for purposes of inspecting the manufacturing, assembly and testing of the hanger assemblies.

6.0 IDENTIFICATION, STORAGE & HANDLING. Identification marks shall be used on the strand to facilitate erection and the Contractor shall use suitable means to protect the strands in transit and during the handling and erection. Strands shall be properly coiled or rolled on reels. Any kinked or damaged strand will be rejected. Straightening of bent wires will not be permitted.

7.0 INSTALLATION. Hangers shall be installed so that the strands at each panel will be equally stressed. Necessary adjustment shall be provided through the use of threaded sockets.

The hanger strand shall be erected with sockets in the same relative position to each other as when the strands were measured and the sockets installed, with the markings along the length of the strand in a straight line.

Spacers shall be located at the intersection of network hangers. Spacers shall incorporate an elastomeric element for purposes of providing a degree of damping and shall hold the individual ropes or strands of each hanger in their correct geometric relationship.

8.0 SUBMITTALS. The Contractor shall submit to the Engineer for approval with KYTC concurrence all details, calculations, and any required shop drawings, catalog cuts, materials, equipment, methods and procedures proposed for: the manufacture and fabrication of the hangers and sockets; the assembly, testing, and erection of the hangers; and for the fabrication, furnishing, and installation of the hanger spacers; all complete in place. All calculations and shop drawings shall be signed and sealed by an Engineer registered in the Commonwealth of Kentucky.

The Contractor's submittal shall include all material designations and certified test reports or certificates of conformance or compliance, furnished by the manufacturer's testing laboratory or independent testing agency, attesting that all materials meet the requirements specified herein. Included in the submittal shall be the exact sizes of the strand proposed for the hangers, together with details for the construction of the hanger, giving the exact number and size of wires in each of the outer and inner layers, and their arrangement. The Contractor shall also submit the results of all tests performed on the fabricated spacer units during the construction process, such as shear tests, and any required stress-strain tests.

The geometric dimensions shown on the plans relative to hanger lengths and strand elongations or that are otherwise dependent on the hanger modulus of elasticity, shall be adjusted if the actual modulus of elasticity, as determined by the Contractor after prestressing the strand, differs from the design assumptions. In that case, the proposed adjustments shall be submitted with calculations to the Engineer for approval with KYTC concurrence.

9.0 MEASUREMENT. The cost of furnishing, fabricating, testing and installing of the hanger assemblies, including structural strand, anchor sockets, pins, threaded rods, nuts, washers, cotter pins and strand spacers and for galvanizing shall be included in the lump sum unit price for Bridge Strand Hanger. .

10.0 PAYMENT.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24608EC	BRIDGE STRAND HANGER – FABRICATE & INSTALL	LS

SPECIAL NOTE FOR DISK BEARINGS

1.0 DESCRIPTION AND SCOPE OF WORK

- 1.1 SCOPE: This work shall consist of furnishing Multi-Rotational, High Load Disc Bearings and installing disc bearing assemblies at the locations shown on the plans and in accordance with these specifications and the *AASHTO LRFD Bridge Design and Construction Specifications*. Bearing assemblies shall include bearing device, distribution plates, distribution pads, and connection hardware as shown in the plans.
- 1.2 DESCRIPTION: Disc bearings shall consist of a polyether urethane structural element (disc) confined by upper and lower steel bearing plates. The bearing shall be equipped with an uplift shear resisting mechanism and uplift guide bars capable of resisting the loads shown in the plans. Bearings shall adequately provide for the thermal expansion and contraction, extreme events, rotation, camber changes, and creep and shrinkage of structural members, where applicable.

2.0 EXPERIENCE REQUIREMENTS AND SUBMITTALS

2.1 QUALIFIED SUPPLIERS

The D.S. Brown Company
300 East Cherry Street
North Baltimore, Ohio 45872

R. J. Watson, Inc.
11035 Walden Ave
Alden, NY 14004

The contractor should note that he/she is not limited to sourcing the disc bearings from the above suppliers. Alternate suppliers shall submit to the Engineer documented previous projects, which at a minimum, meet the qualification requirements of Section 2.2. The Engineer shall determine if the submitted documentation is satisfactory for qualification.

- 2.2 QUALIFICATION REQUIREMENTS: Disc bearings and the bearing supplier shall be subject to the qualification requirements for acceptance listed below.
- A. Disc bearings shall be designed and constructed in accordance with *AASHTO LRFD Bridge Design Specifications 6th Edition, Section 14*, and *AASHTO LRFD Bridge Construction Specifications 3rd Edition, Section 18*.
 - B. The supplier shall show previous history in the design and fabrication of disc bearings. Documentation showing a minimum of five years experience and bridge installations shall be provided to the Engineer.
 - C. Sliding bearings shall be stiff in shear, i.e. negligible shear displacements shall occur within the vertical load support element.

- 2.3 SHOP DRAWINGS: The contractor shall submit shop drawings to the Engineer for approval, and shall have received said approval prior to the construction of the beam seats and fabrication of disc bearings. These drawings shall include, but not be limited to, the following information.
- A. Plan and elevation of each disc bearing size
 - B. Complete details and sections showing all materials (with ASTM or other designations) incorporated in the disc bearings.
 - C. Vertical and horizontal load capacities and movement ratings.
 - D. All bearing connection details.
 - E. Design calculations verifying compliance with AASHTO standards.

The shop drawings and design calculations shall be sealed by a professional Engineer employed by the bearing supplier with at least five years of documented history of disc bearing design experience.

- 2.4 CERTIFICATE OF COMPLIANCE: In addition to records of test results, the contractor's disc bearing supplier shall submit Certificates of Compliance for the disc bearings indicating the materials, fabrication, testing, and installation are as specified herein.

3.0 DISC BEARING FUNCTION AND CONSTRUCTION

3.1 FUNCTION

- A. Bearing capacity shall satisfy the capacities as designated by the contract documents.

3.2 CONSTRUCTION

- A. Bearings delivered to the bridge site shall be stored under cover on a platform above the ground surface. Bearings shall be protected at all times from damage. When placed, bearings shall be dry, clean, and free from dirt, oil, grease, or other foreign substances.
- B. Bearing devices shall not be disassembled unless otherwise permitted by the Engineer or manufacturer.
- C. Bearings shall be installed in accordance with the alignment plan and installation scheme as shown in the contract plans. Upon final installation of the bearings, the Engineer shall inspect the bearing components to assure that they are level and parallel to within ± 0.03125 in/ft. Any deviations in excess of the allowed tolerances shall be corrected.
- D. Bearing assemblies shall be handled and installed in accordance with the manufacturer's instructions as approved by the design Engineer.
- E. Caution shall be taken to ensure that the steel temperature directly adjacent to the polyether urethane rotational element does not exceed 225°F. The polyether urethane disc must not be exposed to direct flame or sparks.

4.0 TESTING, MATERIALS, AND EQUIPMENT

4.1 TESTING:

- A. Production bearing sampling and testing shall be performed in accordance with *AASHTO LRFD Bridge Construction Specifications, Sections 18.3.4 and 18.1.5*.
- B. The Long-Term Deterioration Test per *AASHTO LRFD Bridge Construction Specifications, Section 18.1.5.2.7* shall be satisfied by pre-qualification unless otherwise specified in the contract plans.
- C. Each bearing shall be visually examined both during and after testing. Any resultant defects, which include, but are not limited to, bond failure, physical destruction or cold flow of PTFE to the point of debonding, shall be cause for rejection. Defects such as permanently extruded or severely deformed elastomer or cracked steel shall also be cause for rejection.

4.2.1 MATERIALS AND EQUIPMENT:

- A. All materials shall be new and unused, with no reclaimed material incorporated in the finished bearing.
- B. The physical properties of the polyether urethane elements shall conform to *AASHTO LRFD Bridge Construction Specifications, Table 18.3.2.8-1*.
- C. All steel plates except stainless steel components of the bearing shall conform to the requirements of the type of steel designated on the contract plans; either ASTM A36, A588 or A572
- D. Stainless steel shall conform to the requirements of ASTM A240 – Type 304. Higher grades of stainless are permissible. Stainless steel in contact with PTFE shall be polished to a No. 8 bright mirror finish. The minimum thickness of stainless steel sheet shall be 12 gage.
- E. Polytetrafluoroethylene (PTFE) sheet shall be manufactured from pure virgin (not reprocessed) PTFE resin. PTFE sheet shall meet the applicable material requirements of *AASHTO LRFD Bridge Construction Specifications, Section 18.8.2*. Alternative low coefficient of friction materials shall be considered for use on both the guide bars and horizontal sliding surface. Materials used on the horizontal sliding surfaces shall be more durable than PTFE with a coefficient of friction similar to PTFE.

5.0 FABRICATION

5.1 FABRICATION DETAILS

- A. Elastomeric rotational element shall be molded as a single piece, separate layers are not allowed.
- B. The contractor shall provide the Engineer with written notification prior to the start of bearing fabrication. This notification shall include all of the information required by

Section 2. The bearing fabricator shall be certified by the American Institute of Steel Construction (AISC) for Simple Steel Bridges Category.

- C. All steel surfaces exposed to the atmosphere, except stainless steel surfaces, shall be hot dip galvanized per ASTM A123 or painted to match the girders using a paint system from the KYTC List of Approved Materials. Prior to coating, the exposed steel surfaces shall be cleaned in accordance with the recommendations of the coating's manufacturer.
- D. Stainless steel sheet shall be attached to its steel substrate with a continuous seal weld.
- E. All welding shall conform to, and all welders shall be qualified in accordance with, the requirements of the American Welding Society (AWS).
- F. Except as noted, all bearing fabrication tolerances shall be in accordance with *AASHTO LRFD Bridge Construction Specifications, Table 18.1.4.2-1*.
- G. Each bearing shall be stamped with the manufacturer's name, bearing type or model number, bearing number and the installed location. The stamp shall be on a surface visible after installation.
- H. After assembly, including sole plates, load plates, and masonry plates as applicable, bearing components shall be held together with steel strapping or other means to prevent disassembly until the time of installation, unless otherwise permitted by the Engineer.

6.0 MEASUREMENT

The final quantity of Disk Expansion Bearings will be the actual number of individual bearings acceptably furnished and placed during the project. The Department will not measure bearings replaced due to damage or rejection.

7.0 PAYMENT

The Department will pay for the Disk Expansion Bearings at the contract unit price bid for each. The Department will not pay for bearings replaced due to damage or rejection. Payment is full compensation for furnishing all materials and equipment necessary to install, operate, move, repair, and maintain or replace the disc bearings. All prescribed work shall be done in a workmanlike and acceptable manner including all labor and incidentals necessary for completion. The Department will make payment for the completed and accepted quantities under the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Disk Expansion Bearing	Each

SPECIAL NOTE FOR LEAD CORE ELASTOMERIC SEISMIC ISOLATION BEARINGS (TYPES A & B)

Trigg County
US 68/KY80 Bridge over Lake Barkley

This Special Note applies to the six Lead-Core Elastomeric (LCE) Seismic Isolation Bearings for Span 8 as indicated on the Contract Plans. Bearings will be procured by the Department under separate contract and furnished to the Contractor for installation. The Contractor shall assume all responsibility for the furnished material once the Department-furnished materials are turned over to the Contractor as per section 106.07 of the standard specifications.

This Special Note supplements information provided in the standard specifications. Where a conflict exists between this Special Note and the standard specifications, the provisions herein shall govern.

1.0 DESCRIPTION. This work consists of pickup, handling, storing, delivering and installing six Lead-Core Elastomeric Seismic Isolation Bearing assemblies (“bearing assemblies”), procured by the Department and furnished to the Contractor, for installation at the locations shown on the Contract Plans in accordance with: this special note; KYTC Standard Specifications for Road and Bridge Construction, 2012 Edition (KYTC); *AASHTO LRFD Bridge Design Specifications*, 6th Edition, 2012 (*AASHTO LRFD Design*); *AASHTO LRFD Bridge Construction Specifications*, 2010 (*AASHTO LRFD Construction*); and *AASHTO Guide Specifications for Seismic Isolation Design*, 3rd Edition (*Guide Specifications*). The work also includes the fabrication, delivery and installation of the masonry plate and shear studs, including surface preparation of the grout pocket and all grouting required to properly install the masonry plate, shear studs and bearing.

For purposes of this Note “bearing assembly” is defined as the top load plate, top and bottom LCE mounting plates, lead-core isolator and sub-base plate. The bearing assembly is also denoted “replaceable bearing” in the Plans.

Design, fabrication and testing of the bearings will be completed by the Department under separate contract, and the procured bearings, approved shop drawings, and relevant test results will be provided by the Department to the Contractor.

The LCE Seismic Isolation Bearing as shown in the Plans consists of a lead-core elastomeric energy absorbing device (isolator) bonded to top and bottom mounting plates. All items below the tie girder sole plate, including top load plate, isolator, mounting plates, sub-base plate, masonry plate, shear studs and grout plinth/pocket shall be considered part of the LCE isolation bearing system.

1.1 Pre-Approved Supplier. The following manufacturer will provide all six arch main span (Span 8) LCE bearings and required test results to the Department as part of a separate contract:

Seismic Energy Products
518 Progress Way
Athens, TX 75751
Ph. (903) 675-8571

1.2 Quality Assurance / Quality Control. Fabrication of the isolation bearings will be performed under a separate procurement contract in accordance with the applicable provisions of the *AASHTO LRFD Bridge Design Specifications*, the *AASHTO LRFD Bridge Construction Specifications* and the *AASHTO Guide Specifications for Seismic Isolation Design*. Inspection and testing was the responsibility of the Fabricator Quality Control (FQC) staff.

1.4 Shop Drawings Furnished by the Department. The Department will provide to the Contractor approved shop drawings that were prepared by the LCE Supplier under separate contract. These shop drawings include:

- a. Detailed drawings of the individual isolation bearings and overall seismic bearing assemblies.
- b. A description of material properties and conformance specifications for the isolation bearings including the isolators, tap bolts, top load plates, and sub-base plates.

1.5 Shop Drawings to be provided by the Contractor

- a. Prior to fabrication, submit for review and obtain approval from the Engineer of shop drawings for the masonry plates and shear studs.
- b. Prior to fabrication, submit for review and obtain approval from the Engineer of the installation plan; casting the grout pockets and plinths, and installing the bearing assemblies.

2.0 MATERIALS (for Contractor reference)

2.1 LCE Seismic Isolation Bearing. Isolator with mounting plates shall meet the following material requirements:

- a. Internal steel reinforcing plates shall, as a minimum, conform to ASTM A1011 Grade 40.
- b. LCE mounting plates provided by the bearing manufacturer shall, as a minimum, conform to ASTM A572, Grade 50.
- c. The purity of lead shall be established from a sample of lead used in the isolators and shall demonstrate a minimum of 99% purity.
- c. The elastomer shall be Grade 3 Natural Rubber.
- e. Results showing performance within the stated parameters shall be provided for each elastomer formulation used in the isolators. Tests performed within the previous 12 months are acceptable for the following tests:
 - Compression Set (ASTM D395) at 70°C for 22 hours:
Maximum permissible set = 40%.
 - Bond Strength (ASTM D429, Method B):

Minimum bond strength = 40lb/in, 100% rubber tear.

- Heat Resistance (ASTM D573) at 70°C for 7 days:
Maximum permissible change in tensile strength = -25%
Maximum permissible change in ultimate elongation = -25%
Maximum permissible change in durometer hardness = +10%

- Ozone Resistance (ASTM D 1149)

Representative strips of material shall be prepared in accordance with ASTM D518, Method A. The tests shall be performed at a concentration of 50±5 parts per hundred million, at 20% strain after conditioning at 38°C±1 for 100 hours. No cracks shall be visible using 7X magnification.

f. Results from tests performed on each batch of elastomer used in the isolators shall demonstrate compliance with the following requirements:

- Tensile Strength (ASTM D412):
Minimum permissible tensile strength = 2500 psi
- Elongation at break (ASTM D412):
Minimum permissible elongation at break = 500%
- Shear Modulus at 50% Shear Strain (ASTM D4014):
Maximum permissible variation from design value=±10%

2.2 Masonry Plates, Sub-Base Plates, Top Load Plates, Shear Studs. Masonry plates, sub-base plates, and top load plates shall conform to M270 Grade 50W steel. Material for shear studs shall conform to ASTM A108.

2.3 Grout for Shear Stud Pocket. Shear stud pocket shall be prepared as indicated on the plans and filled by the Contractor with a non-shrink grout from the Department's List of Approved Materials and conforming to KYTC Section 601.

3.0 DESIGN AND PERFORMANCE REQUIREMENTS (for Contractor reference)

3.1 Seismic Acceleration & Response Spectra

Seismic isolation bearing analyses have been performed in accordance with the Guide Specification using the following criteria:

- Seismic Design Category: D
- Site Specific Design Response Spectrum: See Table 3.1a
Note that the design response spectrums presented below are for the 1,000 year return event.

Table 3.1a: Design Response Spectrum

Main Span West Pier 7			Main Span East Pier 8		
Station Range			Station Range		
	Horizontal	Vertical		Horizontal	Vertical
T _m (sec)	S _a (g)	S _a (g)	T _m (sec)	S _a (g)	S _a (g)
0.001	0.363	0.242	0.001	0.539	0.359
0.110	1.328	0.886	0.110	1.689	1.126
0.191	1.328	0.886	0.114	1.689	1.126
0.470	1.328	0.886	0.232	1.689	1.126
0.500	0.890	0.593	0.350	1.689	1.126
0.600	0.519	0.346	0.400	0.847	0.565
0.700	0.295	0.197	0.500	0.414	0.276
0.800	0.258	0.172	0.600	0.344	0.230
0.900	0.230	0.153	0.700	0.295	0.197
1.000	0.207	0.138	0.800	0.258	0.172
1.100	0.188	0.125	0.900	0.230	0.153
1.200	0.172	0.115	1.000	0.207	0.138
1.300	0.159	0.106	1.100	0.188	0.125
1.400	0.148	0.098	1.200	0.172	0.115
1.600	0.129	0.086	1.300	0.159	0.106
1.700	0.122	0.081	1.500	0.138	0.092
1.900	0.109	0.073	1.600	0.129	0.086
2.100	0.098	0.066	1.800	0.115	0.077
2.300	0.090	0.060	2.000	0.103	0.069
2.500	0.083	0.055	2.200	0.094	0.063
2.700	0.077	0.051	2.400	0.086	0.057
2.900	0.071	0.048	2.600	0.079	0.053
3.100	0.067	0.044	2.800	0.074	0.049
3.300	0.063	0.042	3.000	0.069	0.046
3.500	0.059	0.039	3.200	0.065	0.043
3.700	0.056	0.037	3.400	0.061	0.041
3.900	0.053	0.035	3.600	0.057	0.038
4.100	0.050	0.034	3.800	0.054	0.036
4.300	0.048	0.032	4.000	0.052	0.034
4.500	0.046	0.031	4.200	0.049	0.033
4.700	0.044	0.029	4.400	0.047	0.031
4.900	0.042	0.028	4.600	0.045	0.030

5.100	0.041	0.027	4.800	0.043	0.029
5.300	0.039	0.026	5.000	0.041	0.028
5.500	0.038	0.025	5.200	0.040	0.026
5.700	0.036	0.024	5.400	0.038	0.026
5.900	0.035	0.023	5.600	0.037	0.025
6.100	0.034	0.023	5.800	0.036	0.024
6.300	0.033	0.022	6.000	0.034	0.023
6.500	0.032	0.021	6.200	0.033	0.022
6.700	0.031	0.021	6.400	0.032	0.022
6.900	0.030	0.020	6.600	0.031	0.021
7.100	0.029	0.019	6.800	0.030	0.020
7.300	0.028	0.019	7.000	0.030	0.020
7.500	0.028	0.018	7.200	0.029	0.019
7.700	0.027	0.018	7.400	0.028	0.019
7.900	0.026	0.017	7.600	0.027	0.018
8.100	0.026	0.017	7.800	0.026	0.018
8.300	0.025	0.017	8.000	0.026	0.017
8.500	0.024	0.016	8.200	0.025	0.017
8.700	0.024	0.016	8.400	0.025	0.016
8.900	0.023	0.015	8.600	0.024	0.016
9.100	0.023	0.015	8.800	0.023	0.016
9.300	0.022	0.015	9.000	0.023	0.015
9.500	0.022	0.015	9.200	0.022	0.015
9.700	0.021	0.014	9.400	0.022	0.015
9.900	0.021	0.014	9.600	0.022	0.014
10.000	0.021	0.014	9.800	0.021	0.014
			10.000	0.021	0.014

3.2 Loads.

- a. Bearing shall be designed to resist, at a minimum, the following unfactored reactions as provided in Table 3.2a.

Table 3.2a: Unfactored Dead and Live Load Reactions (per bearing)

Location	Bearing Type	Dead Load Vertical (kips)	Live Load Vertical (kips)	Dead Load Longitudinal (kips)	Live Load Longitudinal (kips)	Braking Force (kips)	Live Load Rotation (rad)
Pier 7	A	2743	609	76	17	17	0.003
Pier 7	B	301	357	54	11	17	0.003
Pier 8	A	2743	609	77	17	17	0.003

Pier 8	B	301	357	54	11	17	0.003
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- b. Bearing shall be designed to resist, at minimum, the service lateral loads as provided in Table 3.2b. Additionally, the bearing shall be designed such that the deflection does not exceed the values provided in Table 3.2b for the specified load case.

Table 3.2b: Wind Service Lateral Reactions (per bearing)

Location	Bearing Type	Wind (0.3WS*) (kips)	Max. deflection due to Wind (0.3WS) (inches)	Wind (1.0WS**) (kips)	Max. deflection due to Wind (1.0WS) (inches)	Wind on Live (1.0WL*) (kips)	Max. deflection due to Wind on Live (1.0WL) (in)
Pier 7	A	24	0.46	81	1.54	14	0.3
Pier 7	B	24	0.46	82	1.54	14	0.3
Pier 8	A	24	0.46	81	1.53	14	0.3
Pier 8	B	24	0.46	79	1.49	14	0.3

* Based on a Keff (elastic value) of 103 (k/in). Stiffness must remain elastic for Service Load condition with 0.3Ws.

** Based on a Keff value of 53 (k/in).

- c. Bearings shall be designed to resist, at minimum, the strength lateral loads and displacements as provided in Table 3.2c. Additionally, the bearing shall be designed such that the deflection does not exceed the values provided in Table 3.2c for the specified load case.

Table 3.2c: Maximum Strength Wind Loads (per bearing)

Location	Bearing Type	Wind (1.4WS*) (kips)	Max. deflection due to Wind (1.4WS) (inches)
Pier 7	A	114	2.15
Pier 7	B	114	2.15
Pier 8	A	114	2.15
Pier 8	B	111	2.09

* Based on a Keff value of 53 (k/in)

- d. Bearing shall be designed to resist, at minimum, the temperature lateral loads and displacements as provided in Table 3.2d. Additionally, the bearing shall be

designed such that the deflection does not exceed the values provided in Table 3.2d for the specified load case.

Table 3.2d: Thermal Movement and Demands (per bearing)

Location	Bearing Type	Temperature Rise (inches)	Max. Force Temperature Rise* (Kips)	Temperature Fall (inches)	Max. Force Temperature Fall** (Kips)
Pier 7	A	1.48	79	2.21	89
Pier 7	B	1.48	79	2.21	89
Pier 8	A	1.48	79	2.21	89
Pier 8	B	1.48	79	2.21	89

* Based on a Keff value of 54(k/in)

** Based on a Keff value of 40(k/in)

- e. Bearings shall be designed to resist the minimum total design displacement provided in Table 3.2e. The minimum Keff of the bearing at this total design displacement shall be as specified in the table. The bearing shall be designed to resist a force, at minimum, equal to the total design displacement of the bearing multiplied by the actual bearing Keff value at that displacement.

Additionally, in accordance with Section 12.3 of the Guide Specification, the bearing shall be designed such that it is stable under 1.2 times the dead load shown in Table 3.2a at a horizontal offset equal to 1.5 times the total design displacement.

Table 3.2e: Minimum Seismic Stiffness and Displacement Requirements (per Bearing) (EQ)

Location	Bearing Type	Total Lateral Design Displacement (in)
Pier 7	A	1.55
Pier 7	B	1.56
Pier 8	A	2.37
Pier 8	B	2.64

4.0 FABRICATION

(Underlined provisions apply to the work of this contract. Other sections are provided for Contractor reference)

4.1 General. Fabrication shall be in accordance with this Special Note and AASHTO *LRFD Construction*.

4.2 Welding. All welding shall conform to and all welders shall be qualified in accordance with the requirements of the current AASHTO/AWS D1.5M/D1.5 *Bridge Welding Code*.

4.3 LCE Isolator with Mounting Plates. Mounting plates shall be vulcanized bonded to the isolation bearing and mechanically connected to the internal lead core. Exposed steel surfaces shall be protected from rust by one coat of organic zinc-rich primer. All exposed steel surfaces shall receive a final field coat to be applied by the Contractor in accordance with the plans and specifications. Galvanizing will not be permitted. The surfaces to be painted or metalized shall be shown in the shop drawings.

Areas to be field welded shall not be coated. However, Contractor is responsible for ensuring that all surfaces to be field welded are properly prepared at no additional cost to the Department. This may include abrasive cleaning and/or grinding rusted, primed or painted surfaces as directed by the Engineer and spot priming after welding but prior to applying the final paint coat.

4.4 Masonry, Sub-Base, Top Load Plates and Shear Stud Coats shall be cleaned and painted by the Contractor per the Contract Plans General Notes.

4.5 Other Coatings. Connection bolts and washers shall be mechanically galvanized as described in AASHTO M 154.

5.0 SAMPLING, TESTING & INSPECTION

(Underlined provisions apply to the work of this contract. Other sections are provided for Contractor reference)

5.1 Testing and Inspection for Fabricator Quality Control. Fabrication quality control is part of an earlier contract. The Contractor shall provide material certificates for all items not furnished by the Department.

5.2 Fabrication Tolerances. The tolerances on isolator dimensions prior to testing shall be as follows:

External Plan Dimensions	$\pm \frac{1}{4}$ inch
Overall height	$\pm \frac{1}{4}$ inch
Variation between top and bottom surface	≤ 0.005 radian
Variation of sides from theoretical	$\pm \frac{1}{4}$ inch
Flatness of external plates	$\pm \frac{1}{16}$ in. per 36 in.

Each isolator shall be marked with the isolator serial number specified by the manufacturer.

5.3 Prototype Tests. Isolation system suppliers shall submit characterization test results by means of the evaluation findings of the Highway Innovative Technology Evaluation Center and shall also submit prototype test results in accordance with Section 13.2 and 13.3 of the AASHTO *Guide Specifications*.

Prototype tests shall be performed on the isolators fabricated for the subject project. Testing of similarly sized or reduced scale specimens is not allowed. As per section 13.2 of the AASHTO *Guide Specifications*, prototype tests shall be performed on a minimum of two isolators of each type shown in this specification. However, if tests of any isolator fail

to meet the requirements of the AASHTO *Guide Specifications*; then all isolators of that type shall be tested and any isolators that fail to meet the requirements shall be rejected. Fabrication of the remaining bearings shall not be continued until prototype test results are approved by the Engineer.

5.4 Quality Control Tests. Each isolator shall be tested and evaluated in accordance with the requirements of the AASHTO *Guide Specifications*, Section 15.2. Any bearing that fails to satisfy the requirements shall be rejected.

6.0 IDENTIFICATION, STORAGE & HANDLING. The Contractor will pickup the bearings within 180 days of contract award. Pickup will be from the Department of Highways Maintenance Facility for Calloway County, which is adjacent to the Murray Section Construction Office.

This Facility is located at:
200 Industrial Road
Murray, KY 42071

Every bearing shall have the project identification number, lot number and individual bearing number indelibly marked with ink on a side that will be visible after erection. Bearing assemblies shall be handled by their bottom surfaces only, and shall not be lifted by their tops, sides and/or shipping bands. Completed bearings shall be individually banded in the upright position. When in storage the bearings shall be kept banded, wrapped and secured in a clean, dry and upright position. Maintain the packaging and provide adequate protection to prevent damage from impact as well as from dust and moisture contamination during shipping and storage. The bearings shall be stored with the top and bottom LCE mounting plates, the top load plate, the sub-base plate and the isolator all assembled together. The bearings shall be stored in an indoor storage facility. At no time prior to completion of the project may any bearing be disassembled without authorization from the Bearing Supplier.

7.0 INSTALLATION

7.1 Preparing Concrete Bearing Areas. The sides and bottom of the grout pocket shall be cleaned of laitance and loose and foreign material prior to setting masonry plates. The Contractor shall mark the location of the masonry plates in the pockets (by plan station and offset.) Masonry plates on each pier shall be set by template to the indicated elevation and alignment and positively secured to the top of the pier prior to grout placement.

7.2 Substructure Survey. After preparing concrete surface and setting masonry plates, the Contractor shall perform a horizontal and vertical control survey of the center and corner of each plate. The Engineer will inspect the bearing components to ensure that they are level and parallel to within ± 0.005 radians. Any deviations in excess of the allowed tolerances shall be corrected.

7.3 Grouting Stud Pocket. Prior to grouting, contact surfaces of pocket shall be coated with concrete bonding agent. Grout shall be place into pocket under pressure until the voids are completely filled and grout exits the vent holes on the top of the masonry plate and overflows the perimeter of the masonry plate. Strike off excess grout and provide a clean bearing surface for the installation of the bearing components. Completely remove

all overflow grout located above the top-of-bearing elevation. Properly collect and dispose of all overflow grout in an environmentally safe manner.

7.4 Seismic Bearing Assemblies. Care shall be taken during storage and installation of the isolators to prevent damage to the isolator or coating materials on the steel.

The bearing assemblies shall be installed level in exact position (true roadway station and offset, or as adjusted by the Engineer due to substructure location out of tolerance), and the bottom LCE mounting plate shall have full and even bearing upon the sub-base plates. Bearing sub-base plates shall have full and even bearing upon and shall be field welded to the masonry plates. Any superstructure gradients are accommodated by tapered sole plates which are part of the arch tie girders or end floor beams. The top load plate shall be in full contact with the sole plates and shall be field welded to the sole plates. The top LCE mounting plate shall have full and even contact with the top load plates. Connections shall be adjusted as necessary, under the direction of the Engineer, to obtain full contact. All grout holes in the masonry plates shall be covered by the sub-base plate after field welding the plates together.

Contractor shall take care to minimize heat build-up in bearing. Temperature in nearest bearing load plate shall be kept below 200°F. Multiple weld passes may be required.

Contractor shall provide a complete record of the location of each installed isolator, by serial number, to both the Engineer and the manufacturer.

There shall be no obstructions, including bolt extensions, which prevent the isolators from deforming horizontally in any direction. The area around each isolator shall be cleaned of all debris and construction material at the completion of the contract.

7.5 Arch Erection. The seismic bearings shall be installed as outlined in arch erection and camber given in the General Note “Arch Erection and Camber” in the Contract Drawings and Special Note for Steel Erection – Arch Span.

If, at the completion of construction, the seismic bearing assemblies are not vertical at 60°F, the Contractor shall remove the bearing sub-assembly to masonry plate weld and re-center the bearings. Permanent horizontal deflection of the bearings shall be no more than 1/8” measured at the bottom of the bearing sub-assembly top plate.

Approximate jacking force during erection and concurrent stiffness as provided in Table 7.1:

Table 7.1:

Erection Temperature (°F)	Required Jacking Movement (in)	Required Jacking Load (kips)	Effective Stiffness (kip/in)
0	3.6	648	180
60	1	180	180
120	1.6	288	180

8.0 MEASUREMENT.

This work will not be measured.

9.0 PAYMENT.

No separate payment will be made for the work described in this section. The Department will pay for the masonry plate and shear studs as part of the bid item "Structural Steel-Arch Span." Grout and surface preparation for the shear stud pockets and bearing plinths are incidental to the bid item for "Concrete - Class A." All remaining materials and labor associated with preparing concrete surfaces; installing and grouting shear studs; and delivering and installing the seismic isolation bearing assemblies shall be considered incidental to other pay items.

SPECIAL NOTE FOR VISCOUS DAMPERS

1.0 DESCRIPTION AND SCOPE OF WORK

- 1.1 DESCRIPTION: Furnish and install completed fluid viscous damping devices, including mounting pins, girder connection plates, anchor plates, and mounting brackets at the locations shown on the plans in accordance with these specifications and the *AASHTO LRFD Bridge Design and Construction Specifications*.

A. WORK IN THIS SECTION: Principal items include:

- i. Preparation of shop drawings, test reports, designing, fabrication, testing, handling and shipping to the site.
- ii. Extent of fabrication of Fluid Viscous Damping Devices (FVD) work of this section is indicated by the requirements of this section.
- iii. Production Dampers: Provide FVDs, referred to herein as “Production Dampers” in accordance with the specifications.

2.0 EXPERIENCE REQUIREMENTS AND SUBMITTALS

2.1 QUALIFIED SUPPLIERS

Taylor Devices, Inc.
90 Taylor Drive
North Tonawanda, NY 14120-0748
Contact: Paul Tuttobene (585) 624-7259

ITT Enidine, Inc.
7 Center Drive
Orchard Park, NY 14127
Contact: Ben Eder (585) 313-9740

The contractor should note that he/she is not limited to sourcing the FVDs from the above suppliers. Alternate suppliers shall submit to the Owner documented previous projects, which at a minimum meet the qualification requirements of Section 2.2. The Owner shall determine if the submitted documentation is satisfactory for qualification.

- 2.2 QUALIFICATION REQUIREMENTS: FVDs and the FVD supplier shall be subject to the qualification requirements for acceptance listed below.

- A. Documentation of independent product testing by Departments of Transportation, other government agencies, or internationally-recognized facilities/organizations as approved by the engineer of record.
- B. A published test report showing the dynamic characteristics of a design similar to the proposed FVDs. This report shall include force-displacement and force-velocity plots and shall be used to demonstrate the independence of the proposed FVDs to temperature, frequency and cyclic degradation.
- C. A list of five or more projects where FVDs have been installed in a structure for seismic protection. For each project, the FVDs shall have provided a minimum of one year satisfactory service.

2.3 SUBMITTALS

- A. GENERAL: All submittals shall be made as directed by the engineer of record.
- B. SHOP DRAWINGS: Shop drawings shall be submitted to the Engineer with the Steel Girder Shop Drawings. Submit Shop Drawings for:
 - i. Each and every FVD type indicating dimensions and weights.
 - ii. Mounting pins.
 - iii. Mounting brackets.
 - iv. Anchor plates.
 - v. Girder connection plates.
- C. PRODUCT DATA
 - i. FVD: Product Data shall include, but shall not be limited to manufacturer's standard product specifications, a list of production history for seismic dampers, and installation instructions.
 - ii. Paint: Submit manufacturer's literature and data.
- D. CERTIFICATIONS: Submit the following documents, written and signed by the Quality Assurance Manager of the vendor.
 - i. A Certificate of Conformance (C of C) stating that all testing equipment has been checked for accuracy by appropriate standards for the purpose of this specification and that all mill test reports for all steel to be used are on file at the vendor facility.

- E. **INSPECTION AND TEST REPORTS:** Submit the following test reports, written and signed by testing agency approved by the Engineer.
- i. **Production FVD Test Reports:** Submit test data for each production FVD within fourteen (14) calendar days after the completion of testing of the subject FVD.
 - ii. **Final FVD Test Report:** Submit the Final FVD Report, as described in this Section, within twenty-eight (28) calendar days after the completion of all production FVD testing.
- F. **PROPOSED TEST PROCEDURES:** Submit annotated and drafted illustrations of all proposed test apparatus and procedures for tests required by this Section. Such illustrations shall be submitted and approved by the engineer of record and/or architect prior to the commencement of any testing.
- G. **WARRANTIES AND GUARANTEES:** A written warranty of not less than 35 years shall be provided with the cost proposal along with certification that a maintenance plan does not have to be purchased to activate the warranty. The manufacturer of the FVD's specified herein shall have manufactured FVD's of more than 150 kips output for a minimum of 10 years at the same manufacturing site proposed to manufacture the FVD's for this project.

3.0 VISCOUS DAMPER FUNCTION AND CONSTRUCTION

3.1 FUNCTION

- A. **FUNCTION:** The FVD's shall provide an output force in either tension or compression that is directly proportional to the relative velocity between the two ends of the dampers. The damper output force varies only with velocity, and does not change with damper stroke position or orientation angle. The function of the dampers is to absorb earthquake energy, thereby reducing or eliminating damage to the structure when an earthquake occurs.
- B. **FLUID MEDIUM:** The unit shall use inert silicone fluid as the operating fluid medium which shall comply with U.S. Federal Standard VV-D-1078.
- C. **FLUID EXPANSION COMPENSATION:** The unit shall contain provisions to allow for thermal expansion and contraction of the fluid medium to prevent excessive buildup of internal high pressure or vacuum pressure.
- D. **SERVICING PROVISIONS:** The dampers shall be maintenance and service free over a period of at least 35 years and preferably over the expected life of the structure. This means that no inspection, or fluid level verification, or refilling or replacement of fluid or any other parts shall be needed on any basis whatsoever. The dampers shall be designed and constructed so that installation, removal, or replacement, if necessary, shall be a simple process not requiring any special tools or methods.

- E. ADJUSTMENT: The unit shall be designed to provide for a length adjustment of plus or minus 0.25 inch, or an additional plus or minus 0.25 inch of stroke length shall be provided
- F. DIMENSIONS: The overall dimensions of the unit shall be held to a minimum consistent with the requirements of this specification, and in no case shall they exceed the dimensions specified in the plans.

3.2 CONSTRUCTION

- A. GENERAL: The FVD unit shall be of corrosion protected construction with stainless steel piston rod internally mounted.

B. DESIGN LOADS

- i. Axial Design Load: The maximum axial design loads are as follows:

At End Bents 1 & 2 = 250 kips (tension or compression)

FVD shall be capable of providing the maximum design load with the rod fully extended, retracted, or at any intermediate point.

- ii. Lateral Design Loads: The unit shall be designed to withstand a lateral acceleration of 1 g in any direction in any position of rod extension/retraction.
- iii. Fluid Pressure: The unit shall be designed to withstand the following internal pressure:
 - (1) Proof: 200 percent of maximum operating pressure.
 - (2) Burst: 300 percent of maximum operating pressure.
- iv. Factors of Safety: Limit and ultimate loads shall include the effects of load factors included herein. Minimum factors of safety for the unit shall be 2.0 limit and 2.5 ultimate. The unit shall be such that no yielding will result from the application of limit loads and no failure will result from application of ultimate loads.

3.3 PERFORMANCE

A. DAMPING COEFFICIENT

The units shall operate meeting the Damping Constitutive Law: $F = C * V^{\alpha}$

Where,

F = Damper Resistive Force (kips)

C = Damping Coefficient (kips*sec / inch)

V = Velocity (inch / sec)

α = Velocity exponent (dimensionless)

Damper characteristics shall be as follows:

At End Bents 1 & 2 $C = 65 \text{ kip-s/in}$ with $\alpha = 0.5$

Damping shall be present in both directions of travel and meet the performance shown in Figure 1. The normal operating force developed by the unit over the design range of velocity shall always fall within the envelopes as shown in Figure 1.

B. DUTY CYCLES: The unit shall be designed to the amplitude, frequency and time requirements of the following service load and seismic load duty cycles.

- i. Service Load Duty Cycle: 0 to 0.20 in. amplitude at 1 cps for 600,000 cycles per year.
- ii. Seismic Load Duty Cycle: 1 inch mean amplitude (2 inches peak amplitude) at 2.35 cps for 5 cycles (average) per year.

C. MAXIMUM/MINIMUM OPERATING TEMPERATURES: The unit shall be capable of operating at the energy levels, time and the environmental conditions specified herein, without degradation of performance or life as a result of maximum/minimum operating temperature.

D. LEAKAGE: The use of fluid seals that require fluid weepage for lubrication are prohibited. Under non-operating conditions, static seals shall not leak externally. When subjected to proof pressure for three (3) minutes, the unit shall show no visible evidence of external leakage.

E. STROKE: The unit shall be capable of meeting the performance requirements of 3.3 A and C, when cycled about any point within the full stroke of the unit. The full stroke shall be:

At End Bents 1 & 2 = +/- 10 inches

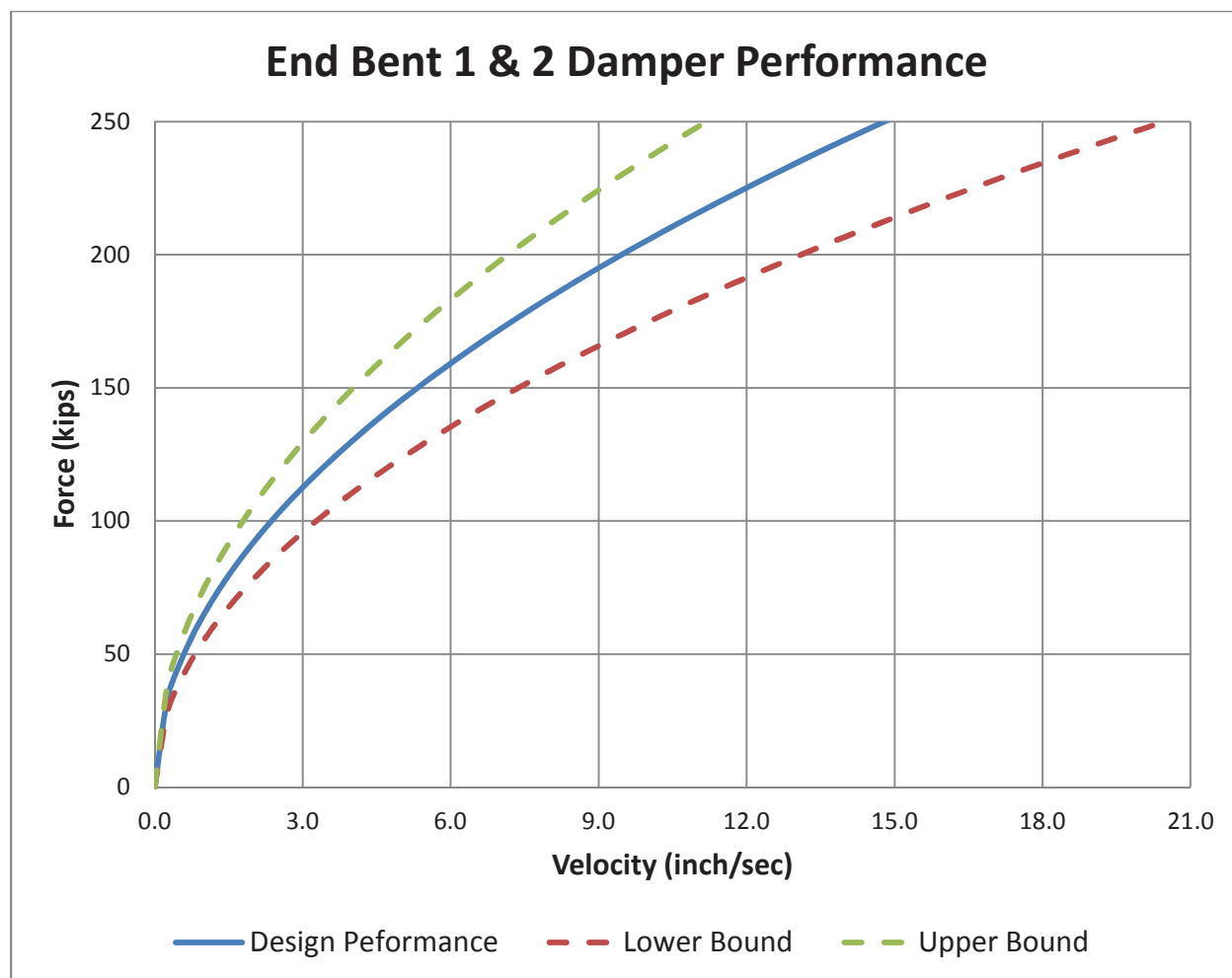


FIGURE 1 – END BENTS 1 & 2 FORCE - VELOCITY DAMPER OUTPUT ENVELOPE

3.4 LIFE

- A. LIFE: The unit shall be designed to guarantee a minimum reuse of one maximum capable seismic event before requiring refurbishment.

3.5 ENVIRONMENTAL CONDITIONS

- A. AMBIENT OPERATING TEMPERATURE: When installed, the unit shall be capable of operating in an ambient air temperature from 0°F to +120°F.
- B. ATMOSPHERIC PRESSURE: The unit shall operate at essentially sea level pressure (760 ±50mm mercury).
- C. HUMIDITY: The unit shall be designed to withstand relative humidity up to 100 percent, including condensation due to temperature change.

- D. SUBMERSION: The unit shall be designed to withstand submersion and be equipped with wipers and/or bellows to protect seals from silt damage.
- E. OTHER ATMOSPHERIC ELEMENTS: The unit shall be designed to withstand any of the probable combinations of the following atmospheric elements: rain, snow, sleet, hail, ice, fog, smoke, wind, ozone, sunshine, sand and dust, and salt atmosphere.

3.6 DELIVERY, HANDLING, AND STORAGE

- A. DELIVERY: Deliver production FVD's to the job site in protective packaging for freight and handling purposes.
- B. HANDLING: Handle FVD's and components carefully to prevent damage, breaking, denting or scoring. Do not deliver damaged FVD's or components; replace with new.
- C. STORAGE: Store FVD's in a clean place. Protect from dirt, fumes, construction debris and physical damage.

3.7 INSTALLATION

- A. INSTALLATION: FVD's shall be installed in accordance with the manufacturer's instructions as approved by the Engineer. FVD's shall not be installed until the bridge deck has been fully cast.

4.0 TESTING, MATERIALS, AND EQUIPMENT

4.1 TESTING OF VISCOUS DAMPING DEVICE UNITS

A. PRODUCTION UNIT TESTING:

- i. Purpose: Production unit testing shall be conducted in order to verify the following:
 - (1) The general quality and manufacturing consistency of each of the production units.
 - (2) The general consistency of all production units in terms of their performance characteristics to meet the requirements of the contract documents.
- ii. Acceptance Criteria:
 - (1) No visible leakage or signs of physical deterioration or degradation in performance shall be observed during and after the series of tests. There shall be no signs of yielding or permanent deformation, or re-torquing of parts.

- (2) The force-velocity results from the tests both in tension and in compression, adjusted for expected variations due to temperature and number of stroke cycles shall fall entirely within the upper and lower bound curves (Figure 1) as used for the final design of the damped structure.

iii. Sequence of Testing:

- (1) Quality Assurance Tests: Production units shall be subjected to and pass the following sequence of quality assurance tests:
 - a. Proof Load Test: An internal pressure shall be applied to each FVD that shall be equivalent to 150% of the maximum damper load (each production unit). This pressure shall be maintained for 180 seconds.
 - b. High Level Proof Load Test: One out of every fifty production units, or a minimum of two (2) units, shall have an internal pressure equivalent to 300% of the maximum damper load (300% maximum operating pressure). This pressure shall be maintained for 180 seconds.
 - c. Life Cycle Test: One out of every fifty production units, or a minimum of two (2) units, shall be cycled through its full end to end displacement for a total of 60 cycles. The cyclic velocity is expected to be much slower than the design maximum velocity and shall depend on the capacity of the approved testing apparatus.
- (2) Performance Verification Tests:
 - a. Production unit testing shall be conducted on all units in order to verify the performance consistency of each production unit. These tests shall be performed in the tension and compression directions and shall verify the force velocity characteristics of the damper. Tests are to be performed at 100% of DBE velocity as determined from dynamic analysis of the structure for 3 cycles. The test results shall fall entirely within the upper and lower bound curves (+/- 15%). The force, displacement and time measurements shall be accurately obtained and recorded. Force-velocity plots shall be constructed from this data.
 - b. For time/cost savings, testing in the compression direction only may be proposed, provided the damper manufacturer can substantiate the balanced nature of fluid orificing in each direction. The use of valves and/or reservoirs or accumulators are not considered a balanced method and will require testing in both directions.

4.2 STANDARDS: Conform to the applicable provisions of the current editions of the following standards, except as indicated otherwise on the drawings or the specifications:

- A. Title 24, Part 2, CCR, 1989 Amendments
- B. ASTM E4 - Load Verification of Testing Machines
- C. ASTM A36 - Specification for Structural Steel
- D. ASTM A325 - Specification for High Strength Steel Bolts
- E. ASTM A570 - Specification for Structural Sheet Steel
- F. AWS D1.1 - Structural Welding Code of the American Welding Society
- G. AMS-W-6858 - Welding, Resistance: Spot and Seam
- H. AWS- C3.4, C3.5, C3.6 - Brazing of Steels, Copper, Copper Alloys, Nickel Alloys, Aluminum and Aluminum Alloys
- I. AWS- C1.4, C1.4M - Welding, Spot, Hardenable
- J. NAV SEA S9074-AQ-GIB-010/248 – Welding and Brazing Procedure and Performance Qualifications
- K. AMS-STD-2175 - Classification and Inspection of Casting
- L. ANSI/ISO/ASQ 9001 (ISO 9001) - Quality Management Systems-Requirements
- M. SAE AS/EN 9100 Quality Management System
- N. ISO 14001 – Environmental Management Systems
- O. AISC “Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings”, by the American Institute of Steel Construction
- P. AISC “Code of Standard Practice for Steel Buildings and Bridges”
- Q. SSPC “Steel Structures Painting Council”
- R. MIL-HDBK-5 “Specifications for Metallic Materials”

NOTE: Proposed alternate standards shall be submitted to the architect/engineer for review and approval.

4.3 FVD MATERIALS AND PARTS

- A. Except as specified herein, the materials, parts and processes used in the design and manufacture of the unit shall conform to specifications and standards selected in the order of precedence established by MIL-STD-970. All materials and processes used shall be identified in vendor drawings by specifications or standards.
- B. MATERIALS: All materials used in the manufacture of the unit shall be subject to approval by the engineer of record.
- i. Materials: Materials shall have allowable stress values taken from MIL-HDBK-5. Unless suitably protected against electrolytic corrosion, dissimilar materials as defined in MIL-STD-889 shall not be used in contact with each other. Dissimilar metal joints shall not be permitted without a non-metallic separator or gasket of at least .06 inch thickness. The use of aluminum, aluminum alloys, magnesium, magnesium alloys, beryllium and beryllium alloys is prohibited. The use of non-stainless steel internally exposed to internal pockets of air or gas (as could occur in an internal reservoir, and plumbing to the reservoir) is allowable provided components are suitably protected from corrosion by means of appropriate surface treatments.
 - ii. Fungus Resistant Materials: Only non-nutrient materials shall be used in the unit.
 - iii. Castings: All castings shall be prohibited for pressure vessel parts or any other parts subjected to tensile or bending stresses, except for parts such as covers, handles, etc. whose failure would not affect the structural integrity or performance characteristics of the unit. Such casting may be Class 2B, subject to the approval of the engineer of record.
- C. PARTS
- i. FVD's shall be constructed of maintenance-free designs only. External reservoirs, external plumbing, and/or fluid level indicators such as sight windows or pressure indicators that may leak are strictly prohibited.
 - ii. Age Sensitive Parts: All non-metallic packing, seals, wipers, bellows, or gaskets shall be of non-age sensitive materials.
 - iii. Piston rods and any part that slides relative to a seal shall be manufactured from stainless steel only. Plating may be applied over the stainless steel if required by the type of fluid seal selected.
 - iv. Operating fluid used in the dampers shall be non-toxic, non-flammable, and cosmetically inert silicone per U.S. Federal Standard VV-D-1078. Petro-chemical fluids shall not be used.

- v. The components of the damper that are pressure vessels are to be of non-tie rod type construction, without externally supported heads or end caps. Welded construction or castings of any type are not permitted for pressure vessel construction.
- vi. Pressure vessels and seals shall be rated for a minimum burst pressure of 300% maximum operating pressure. A randomly selected production unit shall be tested to this pressure, with no loss of fluid or parts failure of any type permitted.
- vii. Parts List Approval: The vendor shall submit the equipment parts list for review and approval by the engineer of record. Approval will be based on an evaluation of the following documentation as applicable to each part.
 - (1) Vendor part number and nomenclature
 - (2) Military or other applicable specifications
 - (3) Source name and part number
 - (4) Testing and inspection requirements

5.0 FABRICATION AND QUALITY CONTROL

5.1 FABRICATION

A. PROCESS

- i. Protective Treatment: Materials subject to deterioration when exposed to environmental conditions likely to occur during service usage, shall be protected against such deterioration in a manner that will in no way prevent compliance with the requirements of this specification. The use of any protective coating that will crack, chip or scale with age or extremes of climate and environmental conditions shall not be used. Corrosion control shall be used as a guide for minimizing corrosion damage to the assembly.
- ii. Fusion Welding: Fusion welding shall be in accordance with approved standards. Weld design shall be based on the function and strength of the assemblies. Fillet welds on plate above 0.125 inches thickness will not be used on primary structure without specific approval by the engineer of record. Weld quality shall be specified on vendor drawings with proper acceptance standards and inspection methods.
- iii. Resistance Welding: Resistance welding shall be in accordance with MIL-W-6858 and MIL-W-45223, as applicable.

- iv. Welder Certification: Certification tests for welders shall be in accordance with AWS D1.1.
 - v. Brazing: The brazing of steels, copper, copper alloys and nickel alloys shall conform to MIL-B-7883.
 - vi. Soldering: Soldering shall be in accordance with approved standards. Whenever insulation material is subject to heating during soldering, the material shall be undamaged and parts fastened thereto shall not be loosened. No mechanical assembly shall depend on soft-solder for mechanical strength.
 - vii. Finish: The exterior finish of the unit, including the color and finish type required shall be recommended by the vendor and submitted to the engineer of record for approval.
- B. WORKMANSHIP: All parts shall be free of burrs and sharp edges and any damage, defect or foreign material which might detract from the intended operation, function or appearance of the unit.

5.2 SAFETY

- A. SAFETY: The design of the unit shall be such that all possible sources of danger to personnel or equipment during assembly, disassembly, testing, operation and maintenance are minimized. Where required, precautionary measures shall be prominently and clearly indicated on the equipment.

5.3 MAINTAINABILITY

- A. MAINTAINABILITY: The unit shall be constructed to be maintenance free. The use of external reservoirs, external plumbing, and/or fluid level indicators shall not be permitted. Each FVD shall be designed and constructed such that installation, removal and replacement, if necessary, shall be a simple process not requiring any special tools or methods. The use of fluid seals that require fluid weepage for lubrication are prohibited.

5.4 INTERCHANGEABILITY

- A. INTERCHANGEABILITY: All parts having the same manufacturer's part number shall be functionally and physically interchangeable. The vendor shall assign new part numbers when change numbers cause any of the following conditions:
- i. Performance or durability is affected to such an extent that superseded items must be discarded for reasons of safety or malfunctioning.
 - ii. Parts, subassemblies of complete units are changed to such an extent that the superseded and superseding items are not interchangeable.

- iii. Superseded parts are limited to use in specific articles or models of articles and the superseding parts are not so limited to use.

When interchangeable repairable assemblies contain a non-interchangeable part, the part number re-identification of the non-interchangeable part, of the next assembly and all the progressive higher assemblies shall be changed up to and including the assembly where the interchangeability is re-established.

5.5 CHANGE CONTROL

- A. CHANGE CONTROL: After initial design completion and approval or initial hardware delivery, whichever occurs first, any change or substitution of material, dimensions, processes or other characteristics must be approved by the engineer of record prior to incorporation. The vendor shall exercise the same configuration control over his suppliers.

5.6 IDENTIFICATION MARKING

- A. IDENTIFICATION MARKING: Units shall be marked for identification in accordance with MIL-STD-130.

5.7 SERIAL NUMBER ASSIGNMENT

- A. SERIAL NUMBER ASSIGNMENT: Sequential serial numbers shall be assigned to all units in accordance with architect/engineer of record's requirements. The individual number shall be assigned according to the vendors standard practice unless otherwise specified in the purchase order or contract.

5.8 QUALITY CONTROL PROVISIONS

- A. PRODUCT QUALITY CONTROL: To ensure effective control over product quality, the vendor shall, establish and maintain a manufacturing/processing control system including written process specifications and procedures to insure that manufacturing, processing, inspection and testing are accomplished in accordance with the following:

- i. Quality Management System Requirements ISO 9001 and AS/EN 9100.

The seller shall provide and maintain a system that complies with U.S. requirements of the current revision of ISO 9001 and AS/EN 9100 for quality assurance in design, manufacture, test, and repair of dampers. Certification to ISO 9001 or AS/EN 9100 by an individual or firm located outside the United States of America is prohibited.

- B. MANUFACTURING PROCESS CONTROL: In addition to compliance with both of the quality assurance systems listed above, the vendor must maintain a system for manufacturing process control of this project which includes as a minimum the following:

- i. Raw Material Traceability.
 - ii. Inspection instructions.
 - iii. In process and final detail component inspection instruction with actual dimensions.
- C. CALIBRATION SYSTEM REQUIREMENTS: All devices used to measure, gage, test, inspect or otherwise examine items to determine compliance with specification and/or contractual requirements shall be calibrated in compliance with the applicable section of the current revision of both ISO 9001 and AS/EN 9100 standards, to a calibrated measurement standard which has known valid relationships traceable to the U.S. National Institute of Standards and Technology (NIST).

6.0 MEASUREMENT

The final quantity of FVDs will be the actual number of individual dampers, including mounting pins, girder connection plates, anchor plates, and mounting brackets, acceptably furnished and installed during the project. The Department will not measure dampers replaced due to damage or rejection.

7.0 PAYMENT

The Department will pay for the Viscous Dampers at the contract unit price bid for each. The Department will not pay for dampers replaced due to damage or rejection. Payment is full compensation for furnishing all materials and equipment necessary to install, operate, move, repair, and maintain or replace the dampers. All prescribed work shall be done in a workmanlike and acceptable manner including all labor and incidentals necessary for completion. The Department will make payment for the completed and accepted quantities under the following:

<u>Pay Item</u>	<u>Pay Unit</u>
Seismic Dampers	Each

SPECIAL NOTE FOR FINGER EXPANSION JOINT

1.0 DESCRIPTION

This work includes the fabrication, furnishing and installation of a tooth expansion joint with a fabric reinforced drainage trough for highway bridge joints. Materials and workmanship shall be in accordance with the KYTC Standard Specifications; AASHTO/AWS D1.5M/D1.5 “Bridge Welding Code”; AWS D1.1/D1.1M “Structural Welding Code – Steel”; AASHTO “LRFD Bridge Design Specifications”, 6th Edition (AASHTO LRFD Design); AASHTO “LRFD Bridge Construction Specifications,” 3rd Edition, 2010 (AASHTO LRFD Construction); the Contract Documents; and this Special Provision.

2.0 MATERIALS

Materials shall conform to the following:

- A. Structural Steel: Steel plate, bars and shapes shall conform to AASHTO M270 (ASTM A709), Grade 50. (Sidewalk and (railing) cover-plates shall conform to AASHTO M270, Grade 50). No aluminum components or hardware shall be used. Galvanize steel components in accordance with ASTM A123.
- B. Welded Studs: Welded studs for anchorage purposes shall conform to ASTM A108.
- C. Anchors Bolts: Anchor bolts, nuts and washers shall be in accordance with ASTM F1554, Grade 55, ASTM A563 Grade DH and ASTM F436, respectively, and shall be hot-dipped galvanized.
- D. Neoprene Trough: Fabric reinforced drainage trough shall be polychloroprene (Neoprene) of the thickness specified in the plans. Trough shall be reinforced with one or two plies of tightly woven polyester or nylon fabric and shall be supplied and installed in one continuous length. The inside surface of the trough shall be smooth to promote self-removal of foreign material during normal joint operation. The shape of the trough shall be designed to minimize stress concentrations at compression strips.

Neoprene/fabric composite material shall comply with the following:

<u>PHYSICAL PROPERTY</u>	<u>ASTM TEST</u>	<u>VALUE</u>
Hardness (Type A Durometer)	D2240	50 to 75 points
Tensile Strength, both directions	D412	2000 lbs/in. minimum
Elongation @ ultimate tensile strength	D412	250% maximum

<u>PHYSICAL PROPERTY</u>	<u>ASTM TEST</u>	<u>VALUE</u>
Tear (Die C)	ASTM D624	120 lbs/in. minimum
Low Temperature Brittleness (22 hrs. @ -20°F, then wrapped around a 3 inch mandrel)	ASTM D2137	No cracks
Ozone Resistance (20% Strain) 100 pphm in air (100 hrs. @ 100°F)	D1149	No cracks

3.0 FABRICATION

Anchor holes, vent holes and tapers shall be machined into the plate. Upon completion, the machined plate shall be galvanized per ASTM A123.

The joint segments shall be manufactured and delivered in pairs of independent elements with parallel gaps between teeth. Both halves (end bent and superstructure) of finger expansion joints shall be fully assembled in the shop to ensure that full joint closure can be attained without binding of fingers. After joint segments have been fully assembled to nominal joint dimensions and approved, they shall be match marked and scored (the upper surface of the finger plates shall be permanently scored to provide two or more parallel lines in both directions) to aid in proper field installation.

4.0 SAMPLING, TESTING & INSPECTION

An independent laboratory, to ensure compliance with these provisions, shall test each lot of composite neoprene/fabric sheeting. Two certified copies of the qualification test data indicating that the tested materials comply with these provisions shall be submitted to the Engineer and KYTC. The sample from each lot shall be one 6-inch piece, 2-foot long.

5.0 IDENTIFICATION, SHIPPING & HANDLING

Expansion joint openings shall be preset prior to shipment and assembled with temporary shipping angles at maximum 5'-0" centers. Fabricator shall show details of all shipping and erection temporary attachments on the shop drawings.

6.0 INSTALLATION

Installation of the expansion dam shall be to the lines and grades shown on the plans and in accordance with Contract Documents and shop drawings. Expansion joint system shall be shipped to job site preassembled.

Align the finger plate or sliding plate joint assemblies in position and check the expansion opening. The expansion opening must be adjusted for temperature prior to bolting, welding or placing concrete on each side of the joint.

Test fit the finger plates or sliding plates with all the armoring and anchorages in place. Install the finger joint centered over the expansion gap, for both fingerplates and sliding plates. Verify that the joint is in plane and sloped per the roadway. Make sure the fingers do not rub during the full range of temperature movement.

The Engineer will confirm the procedure, opening and alignment prior to concrete placement. After confirmation, cast and cure the expansion joint blockout per KYTC specifications. Place concrete under the expansion dams, vibrate until the concrete is forced through air holes, and strike off excess concrete. After the concrete has cured, clean air holes and fill with an approved sealer.

Install the fabric trough and the finger or sliding plates according to the Contract Documents and shop drawings. Do not splice the drain trough, unless indicated. If splices are indicated, use splices vulcanized by the manufacturer. Do not use longitudinal splices.

7.0 SUBMITTALS

Submit shop drawings, for each location, type and model of expansion device used. Shop drawings shall include, but not be limited to, the following:

- A. Complete details of all components and sections showing all materials used in the expansion joints.
- B. A listing of all applicable KYTC, ASTM and AASHTO specifications.
- C. Name and address of the manufacturer, and location of the fabrication plant.
- D. Name and telephone number of the manufacturer's representative who will be responsible for coordination of production, inspection, sampling and testing.
- E. Welding procedures used in the expansion joint assembly manufacture clearly described and detailed.
- F. Table of longitudinal offsets for installation at varying temperatures. Use 60°F as the mean temperature.

Joint shop drawings and neoprene trough shop drawings shall be coordinated to ensure that joints and troughs will fit when field assembled. Fabrication shall not commence until the approved shop drawings are in the hands of the Inspector and fabricator and the Engineer has authorized fabrication.

8.0 MEASUREMENT

Quantity for Finger Expansion Joint will be measured per linear foot from the inside face of the north vehicular barrier to inside face of the pedestrian railing curb. The unit price for Finger Expansion Joint will be full compensation for furnishing, fabricating, installing structural steel tooth plates, roadway joint seals, drainage troughs, catch basins, downspouts, sidewalk plate, barrier cover plates and all material, labor, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.

9.0 PAYMENT

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
23859EC	FINGER EXPANSION JOINT	LF

SPECIAL NOTE FOR MODULAR EXPANSION JOINT

1.0 DESCRIPTION. This work includes the fabrication, furnishing and installation of a watertight modular bridge joint system (MBJS.) The joint system consists of multiple preformed neoprene strip seals mechanically held in place by steel edge and separation center beams. The center beams are supported by support bars suspended over the joint opening on sliding elastomeric bearings. An equidistant control system maintains equal spacing between all center beams and edge beams.

1.1 General. Design, materials and workmanship shall be in accordance with: KYTC Standard Specifications; AASHTO/AWS D1.5M/D1.5 “Bridge Welding Code”; AWS D1.1/D1.1M “Structural Welding Code – Steel”; AASHTO “LRFD Bridge Design Specifications”, 6th Edition (AASHTO *LRFD Design*); AASHTO “LRFD Bridge Construction Specifications,” 3rd Edition, 2010 (AASHTO *LRFD Construction*); the Contract Documents; and this Special Note.

Multiple support bar, single-support bar or swivel joint MBJS systems that meet the provisions of this Special Note may be acceptable for use.

1.2 Acceptable Systems. Only manufacturers who have successfully completed fatigue and performance testing in accordance with Subsection 1.3 will be permitted to supply the MBJS. Submit final results of all required tests to the Engineer for approval prior to manufacture.

1.3 Pre-Qualification Testing Requirements. Before a MBJS can be accepted for installation on this project, the design must be pre-qualified by the manufacturer through successful fatigue and performance testing administered by an independent testing laboratory. Perform fatigue and performance testing in accordance with Section 19, Appendix A19 of AASHTO *LRFD Construction*.

All testing shall be performed on specimens similar to the MBJS system and components to be used for this project and meeting the requirements of the Contract Plans. Successful testing will prequalify such a system—with variations as permitted by the Engineer—for the project, and no further testing will be required.

No claims for delay will be considered for testing or failure to submit required testing documentation in a timely manner.

2.0 MATERIALS. Materials shall conform to the following and shall be identical to those used to meet the Pre-Qualification Testing Requirements of Subsection 1.3:

A. Structural Steel. Structural steel for center beams, edge beams, and support bars, shall meet the physical requirements (tensile strength, yield strength, elongation, and Zone 2 Charpy impact requirements) of ASTM A709, Grade 50. Support boxes, stirrups for attachment to center beams, and sidewalk and railing cover plates shall conform to ASTM A709, Grade 50.

All structural steel not defined herein shall meet the physical requirements shown on the working drawings. The specific steel grade shall meet or exceed the physical requirements listed on the working drawings and/or used in the design calculations. Aluminum components shall not be used.

Welding shall conform to ANSI/AWS D1.1/D1.1M "Structural Welding Code-Steel" and AASHTO/ AWS D1.5M/D1.5 "Bridge Welding Code".

B. Anchors Bolts. Anchor bolts, nuts and washers shall be in accordance with ASTM A307 Grade C, ASTM A563 Grade DH, and ASTM F436, respectively, and shall be hot-dipped galvanized.

C. Studs. Welded studs for anchorage purposes shall conform to ASTM A108.

D. Stainless Steel. Stainless steel sheets conforming to ASTM A240/A240M, Type 304, shall be provided on sliding surfaces. The surface shall be polished to a Number 8 mirror finish.

E. Polytetrafluorethylene (PTFE). PTFE shall be 100-percent virgin material, woven fabric or dimpled sheet conforming to the requirements of Section 18.8 of AASHTO LRFD Construction and shall be provided on every sliding surface.

F. Elastomeric Seal. Preformed elastomeric joint seals shall be of the single diaphragm strip type with a minimum thickness of 7/32" and shall conform to ASTM D5973. The elastomeric seal shall be supplied and installed in one continuous length, and no field splicing shall be allowed. Sealing gland shall meet the movement requirements shown in the Contract Plans and the material requirements as follows:

<u>PROPERTY</u>	<u>ASTM TEST METHOD</u>	<u>VALUE</u>
Hardness, Durometer A	D 2240 (Modified)	50-65 Durometer, Shore A
Tensile Strength, min	D 412	2000 psi
Elongation at break, min	D 412	250%
Compression Set at 72 hours, max	D 395, Method B	40% at 212°F

G. Lubricant-Adhesive. Elastomeric seal shall be installed utilizing a one-part moisture curing polyurethane and aromatic hydrocarbon solvent mixture that complies with ASTM D4070.

H. Springs and Bearings. Springs, bearings, and equidistant devices (sometimes referred to as control springs) shall be of elastomeric or urethane material and shall be of the same material composition and formulation, manufacturer, fabrication procedure and configuration as the ones used in the prequalification test. Urethane foam shall conform to ASTM D3574.

I. Reinforcing Steel. All reinforcing steel in the blockout shall be stainless steel meeting the requirements of “Special Note for Steel Reinforcement - Stainless.”

3.0 DESIGN. The modular bridge joint system shall be designed in accordance with Article 14.5, "Bridge Joints," of AASHTO *LRFD Design*. Limit states, loads, load factors and distribution factors shall comply with Article of 14.5.6.9 and MBJS shall be detailed to resist snowplow damage in accordance with Article 14.5.1.2 of that specification. The MBJS shall meet these additional requirements:

A. Center Beams and Edge Beams.

- each separation beam (center beam) shall be attached, either directly or indirectly, to an independent support beam using a complete joint penetration groove weld; partial penetration welds, fillet welds, bolted connections, or other means to directly or indirectly attach separation beams to support bars, is prohibited
- edge beams shall consist of a monolithic steel shape with a machined or extruded seal retainer cavity; the web of the edge beam cross-section shall be at least ½ in. in thickness
- center beams shall consist of a monolithic steel shape with a machined or extruded seal retainer cavity; the weight of the center beam shall be at least 25 lbs. per foot and the web shall be at least 1¼ in. in thickness
- where field splices are required due to shipping restrictions or stage construction, splices shall be located under the median barrier or away from design wheel paths
- only field-splice details that have been fatigue-tested in accordance with the prequalification tests in Section 1.3 of this Special Note may be used for the center beams and edge beams
- center beam spans with a splice shall not be greater than 4.00 ft.

B. Support Bars and Boxes.

- the maximum allowable spacing between support bars shall be 6.00 feet
- steel plate or tubing for support boxes with a width not greater than 16 in. shall have a minimum thickness of 3/8 in. For support box widths greater than 16 in., the top plate width-to-thickness ratio shall not exceed 45 unless stiffening ribs are used.
- a 2.0 in. minimum gap shall be provided between the bottom surfaces of the MBJS and the deck blockouts to allow adequate placement and consolidation of concrete under and around all parts of the MBJS, including support boxes.

C. Seals.

- the number of seal gaps (cells) shall be such that the maximum opening per cell (clear distance between center beams or center beam and edge beam) shall not exceed 3.15 in. (3 in. nominal) for the Strength Limit State Combinations specified in Table 3.4.1-1 of AASHTO *LRFD Design*.

- the sealing elements shall not extrude above the top of the modular joint seal assembly

D. Support Box Bearings and Springs.

- an equidistant control system, which distributes the total joint opening evenly between cells, shall be incorporated
- support bar bearings and springs shall be positively locked into support boxes with non-metallic dowels or pins; the connection must permit removal and replacement of the bearing and spring components.

E. Performance and Maintenance.

- the joint seal assembly shall be watertight
- the modular joint seal assembly shall be designed with adequate access to all internal components in order to assure the feasibility of inspection and maintenance activities
- the design concept shall accommodate scheduled maintenance and periodic replacement of seals, support bearings and control springs to provide a long-term cost-effective lifetime for the joint seal assembly

Supplemental to the shop drawings, design calculations prepared in accordance with AASHTO *LRFD Design* by an Engineer registered in the Commonwealth of Kentucky shall be provided. Included in the calculations shall be: (a) rotation and longitudinal and transverse horizontal movement capacity; (b) live load, fatigue limits and impact factors utilized; (c) limit state load combinations used; (d) member design; (e) connections design; (f) splice design. The calculations shall include a statement indicating that the joint devices furnished by the manufacturer are adequate for the requirements of the Contract Documents.

4.0 FABRICATION. Expansion joints shall be fabricated and assembled at facilities owned and operated by the manufacturer, the manufacturer being the single entity that designs, fabricates and installs (or supervises the installation of) the joint assemblies.

All structural steel surfaces, except those made of stainless steel, shall be hot-dipped galvanized after assembly, in accordance with ASTM A123. Anchorages and support boxes shall be attached to the edge beam section prior to galvanizing. An anchorage shall be located within 9 in. of each end of each pre-galvanized section.

Stainless steel sheet shall be welded at each edge to the steel substrate by the tungsten-arc welding process in accordance with the current AWS specification. Stainless steel sheet shall be clamped to ensure full contact with the substrate during welding. Welds shall not protrude beyond the sliding surface of the stainless steel. Intermittent fillet welds are not allowed.

Each MBJS shall be assembled and elastomeric seals installed at the fabrication shop. Lubricant adhesive is to be used on all elastomer-to-steel contact areas for seal installation. Continuous glands shall be used for the full length of each MBJS.

When a splice is required for shipping or staged construction, each MBJS is to be shipped in separate sections sized in accordance with Section 3 of this Special Note or with the slab construction joints required for the construction stages as shown in the plans. If field splices will be used, the ends of the edge and center beams shall be staggered by 24 in. so that they are not at

the same point on each beam. Installation of seal elements is not required during fabrication for a MBJS with a splice (since seals must be continuous without splices for the full length of the device.)

5.0 SAMPLING, TESTING & INSPECTION. The MBJS to be used shall be prequalified in accordance with Section 1 of this Special Note.

5.1 Shop Inspection. The full-penetration weld that connects the center beam to the support bar shall be ultrasonically inspected in accordance with AWS D1.1. Twenty-five percent of the center beam-to-support bar welds shall be inspected in this manner, or as directed otherwise by the Engineer. If ultrasonic inspection reveals at least one rejectable weld defect, the fabricator shall then ultrasonically inspect another 25% of the center beam-to-support bar welds (25% of the original total of welds.) If rejectable defects are found in the second 25% set of welds (50% of total), all remaining non-inspected welds shall then be inspected. Each weld that is rejected by ultrasonic inspection shall be repaired using a welding procedure approved by the Engineer. The repaired welds shall be re-inspected ultrasonically in accordance with the original requirements.

The Engineer reserves the right to visit the manufacturer's fabrication shop for purposes of inspecting the manufacturing, assembly or testing of the MBJS.

5.2 Pre-installation Inspection. Immediately prior to installation, the MBJS and the blackout shall be inspected by the Engineer for:

- Proper alignment.
- Complete bond between the seals and the steel.
- Proper placement and effectiveness of studs or other anchorage devices.
- Proper placement of elastomeric springs and bearings.
- Appropriate clearance between the bottoms of the support boxes of MBJS and the surface of the blackout specified on the Contract Plans

5.3 Post-Installation Inspection. The MBJS shall be inspected after installation and again prior to opening the bridge to traffic to verify the following:

- The top surfaces of the MBJS are recessed from the finished roadway profile 0 to 0.25 in.
- There is no more than 0.125-in. difference in elevation among the tops of any of the center beams or edge beams. This variation shall be measured vertically from a straight line connecting the top of the deck profile on each side of the MBJS.
- There is no more than 3/16-in. difference among gap widths along the length of a seal or among the multiple cells of the MBJS.

After installation and prior to final acceptance, deck joint seals shall be tested in the presence of the Engineer for leakage of water through the joint. Any leakage of the joint seal shall be cause for rejection.

6.0 IDENTIFICATION, SHIPPING & HANDLING. The MBSJ shall be delivered to the job site and stored as a single unit with seals installed, or as permitted in Section 4 of this Special Note if a splice is required, and in accordance with the Manufacturer's written recommendations as approved by the Engineer. Damage to the corrosion protection system shall be repaired to the satisfaction of the Engineer. Seals shall not be damaged or cut.

All joint materials and assemblies stored at the job site shall be protected from damage, and assemblies shall be supported so as to maintain their true shape and alignment.

7.0 INSTALLATION. To facilitate proper installation of MBSJ in the field the contractor shall have available the services of a qualified installation technician who is employed full-time by the manufacturer of the expansion joint system being used.

Prior to installation of the joint, the blockout and supporting system shall be protected from damage and construction traffic.

7.1 Supporting MBSJ During Concrete Placement. The MBSJ shall be fully supported during the placement of the concrete. Welds for temporary attachments to the center beams or support bars for erection purposes shall be removed and the surface ground smooth. Damage to the corrosion protection system shall be repaired to the satisfaction of the Engineer using a method approved by the Engineer.

Devices used to maintain the preset openings in the MBSJ shall be uniformly spaced at not greater than 15 ft along its length. A minimum of three such devices shall be used per fabricated segment.

To reduce corrosion of the MBSJ, it shall be electrically isolated from the bridge deck and blockout reinforcement using a 1 inch clear gap or nonconductive sleeve material.

7.2 Placing the Concrete. Concrete shall not be deposited in the forms until the Engineer has performed the Pre-Installation Inspection described in Section 5 of this Special Note and approved the placement of the joint assembly, anchorages and reinforcement.

If there is a vertical grade, concrete shall be placed on the downhill side of the blockout first. The concrete shall be vibrated thoroughly so as to adequately consolidate concrete underneath the support boxes and edgebeams. Care should be taken to avoid displacement of the forms and reinforcing steel.

Devices used to maintain the preset openings in the MBSJ shall be removed within two hours after the concrete is placed.

7.3 Bridging the MBSJ After Installation. Construction loads shall not be allowed on the MBSJ for at least 72 hours after installation is completed. If it is necessary to cross the MBSJ, the Contractor shall bridge over the joint system in a manner approved by the Engineer.

7.4 Acceptance. The Engineer shall perform a Post-Installation Inspection as described in Section 5 of this Special Note. An MBSJ that fails inspection or testing shall be replaced or repaired to the satisfaction of the Engineer at the Contractor's expense.

Any proposed corrective procedure shall be submitted to the Engineer for approval before corrective work is begun.

8.0 SUBMITTALS. The Contractor shall submit details of the MBJS to be used together with installation and waterproofing plans to the Engineer for approval prior to fabrication of the MBJS.

The shop plans shall include, but not be limited to the following:

- plan and section views of the MBJS for each movement rating and roadway width, showing dimensions and tolerances.
- all center beam/support bar joints and all shop and field splices
- complete details of all components and sections showing all material incorporated into the MBJS
- all ASTM, AASHTO or other material designations
- welding procedure specifications
- corrosion protection system
- method of installation, including, but not limited to: sequence; installation gap setting for various temperatures; support during placement of the concrete; lifting locations and lifting mechanisms; and installation at curbs
- temperature adjustment devices and opening dimensions relative to installation temperature
- any required changes to the blockout reinforcement in order to accommodate the MBJS. The design and detail of the reinforcing steel shall meet or exceed the minimum requirement provided in the design plans.
- design calculations in accordance with Section 3 of this Special Note

The Contractor shall also submit the following test reports and certificates for review and approval:

- Manufacturer's certificate of compliance with the AISC Quality Certification Program, Simple Steel Bridges.
- Certification that welding inspection personnel are qualified and certified as welding inspectors under AWS QC1, Standard for Qualification and Certification of Welding Inspectors. Documentation that any personnel performing nondestructive evaluation (NDH) are certified by ASNT.
- Manufacturer's certificate of compliance for the PTFE sheeting or fabric.
- Certification that MBJS passed the Prequalification Tests required in Section 1.3.
- Certification that the bearings, springs, and equidistant devices are the same formulation, manufacturer and configuration that were used in the Prequalification Tests required in Section 1.3. In each certification, the name and address of the Manufacturer of the springs, bearings and equidistant devices shall be provided.

The Contractor shall submit for the Engineer's approval a written maintenance and part replacement plan prepared by the joint manufacturer. This plan shall include a list of parts and instructions for maintenance inspection, acceptable wear tolerances, methods for determining wear, and procedures for replacing worn parts.

Contractor shall submit details of the barrier rail conduit expansion fitting in conjunction with the modular joint barrier rail cover plate details for review and acceptance.

Fabrication shall not commence until the approved shop drawings are in the hands of the Inspector and fabricator and the Engineer has authorized fabrication.

9.0 MEASUREMENT. Quantity for Modular Expansion Joint will be measured per linear foot from inside face of north traffic railing to inside face of pedestrian railing curb. The unit price will be full compensation for furnishing, fabricating and installing MBJS, including sidewalk plate and all barrier and curb cover plates, and all material, labor, equipment, tools and incidentals necessary to complete the work as specified in the Contract Documents.

10.0 PAYMENT.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24610EC	MODULAR EXPANSION JOINT	LF

SPECIAL NOTE FOR STRUCTURE LIGHTNING PROTECTION

Trigg County
US 68/KY80 Bridge over Lake Barkley

1.0 DESCRIPTION AND SCOPE OF WORK

- 1.1 Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highway's 2012 Standard Specifications for Road and Bridge Construction and applicable Supplemental Specifications, the Standard Drawings, this Note, and the attached detail drawings. Section references are to the Standard Specifications.
- 1.2 This work shall include the design, furnishing and installation of a complete structure lightning protection system on the entire bridge. At a minimum this includes:
 - 1.2.1 Design of a Lightning Protection System meeting the requirements of the Specifications, Plans and this Special Note.
 - 1.2.2 Preparation and submittal for approval of shop drawings for Structure Lightning Protection System.
 - 1.2.3 Furnishing all labor, materials, tools, and equipment necessary for installation of Structure Lightning Protection System.
 - 1.2.4 Any related work specified as part of this Contract, as determined by the Department.

2.0 GENERAL

The Structure Lightning Protection for the bridge shall be in accordance with the latest edition of ANSI/NFPA 780-2011 lightning protection installation standards, ANSI/UL 96 lightning protection components and UL96A installation requirements for lightning protections systems. Protection shall include, but not be limited to: air terminals, bonding, interconnecting conductors, and grounding, as required under the provisions of UL 96A and NFPA 780.

3.0 DESIGN

- 3.1 The contractor shall design the layout of components required, and shall prepare shop drawings for the Structure Lightning Protection System. All documents shall be stamped by a Professional Engineer registered in the State of Kentucky. Shop drawings shall be submitted to the engineer for review and approval. The contractor shall receive engineer's approval prior to purchasing any materials or equipment for the Structure Lightning Protection System.

- 3.2 The Lightning Protection System shall be designed to continue to function after the design seismic event. Provide expansion capability equal to or exceeding the movement capacity of the bridge bearings and joints in both horizontal directions.
- 3.3 The main grounding conductors shall run the full length of the bridge. The structure shall be bonded at each Pier and at each End Bent. A grounding conductor shall be run down through the pier column and footing encased in concrete and exothermically connected to the bridge steel piles or shaft casing. At each end bent, a separate grounding conductor shall be run in FRE Conduit down the face of the pier and to the ground rods.
- 3.4 No welding will be allowed on any arch members or plates designated as fracture critical. All other welding must be approved by the Engineer. Only welding as shown on the approved shop drawings will be allowed.

4.0 MATERIALS

- 4.1 All materials shall comply in weight, size and composition with the requirements of the Underwriters' Laboratories, Inc., the National Fire Protection Association Code and OSHA relating to the height of the structure.
- 4.2 All cables, cable fasteners, ground rods, and connectors used in the system shall carry a UL Label "A" & "B" and all lightning air terminals shall carry the Manufacturer's name.
 - 4.2.1 Conductors: Conductors shall consist of commercially pure copper cable, sized in accordance with NFPA Code.
 - 4.2.2 Conductor Fasteners: Conductor fasteners shall be an approved type of noncorrosive metal having ample strength to support conductor.

5.0 INSTALLATION

- 5.1 General
 - 5.1.1 All ungrounded sizable metallic objects within 6' of any component structure protected by the lightning protection ground system shall be bonded to the system with approved fittings and conductors.
 - 5.1.2 Copper materials connecting to steel shall be lead-coated.
 - 5.1.3 Connection between metals shall be made with approved exothermic welds.
 - 5.1.4 All materials shall be appropriately fastened so as to minimize or eliminate the possibility of future displacement or the need for subsequent

maintenance.

5.2 Air Terminals

- 5.2.1 Air terminals shall be an approved type extending not less than 10 inches above the top chord of the arch and shall be securely anchored.
- 5.2.2 Air terminals shall not extend higher than 24 inches except with individual approval or as required by OSHA. Terminals 23 inches and less shall be spaced 20 feet apart.
- 5.2.3 Terminals 24 inches and higher shall be spaced 25 feet apart or as required by codes.

5.3 Conductors: Conductors shall be run concealed.

5.4 Conductor Fasteners: Space 3'-0" O.C. max.

5.5 Ground Connection

- 5.5.1 Drive to the required depth to reach permanent moisture but in no case less than 11'-6". In case of rock ledge or other conditions making compliance impossible, trench or other grounding will be permitted, providing it meets UL requirements.

6.0 MEASUREMENT

Structure Lightning Protection. Measurement will be lump sum and include the design, shop drawing preparation, installation of the Structure Lightning Protection, and all work described in Section 1.0.

7.0 PAYMENT

Structure Lightning Protection. Payment at the contract unit price is full compensation for all work required by this note and as measured in Section 6.0. Apportion the work involved into appropriate units.

Payment will be made under:

BID ITEM CODE

23868EC

STRUCTURE LIGHTNING PROTECTION

LS

The Department will consider payment as full compensation for all work required by this note.

SPECIAL NOTE FOR DECORATIVE FENCE PANEL

1.0 DESCRIPTION. This work includes all labor, equipment and materials to fabricate and install decorative fence panels attached to the pedestrian railing and spaced intermittently, as quantified in the Contract Documents.

2.0 MATERIALS. Materials shall conform to the following:

A. Structural Steel. Steel plate shall conform to AASHTO M270 (ASTM A709), Grade 36 or 50. No aluminum components or hardware shall be used.

B. Anchor Bolts. Anchor bolts, nuts and washers for connection of panel/post base to concrete shall be in accordance with F1554 Grade 36, all metal lock nut Grade C and ASTM F436, respectively, and shall be hot-dipped galvanized.

C. Hardware. Plates, fasteners, nuts and washers for connection of decorative panel assembly to pedestrian railing shall be stainless steel conforming to ASTM A240, ASTM F593 Grade C, ASTM F594 and Type 304.

3.0 DESIGN.

A. Plate. Decorative panels shall be ½" plate steel with plasma or water jet cutouts to create a silhouette.

B. Patterns. Patterns are illustrated in the exhibits attached to this Special Note. Electronic files of these illustrations will be provided in JPEG File Interchange Format upon request to the Contractor awarded this contract. The Contractor will be responsible to create and develop any computer aided design files of the patterns that may be necessary for use in fabrication. Compatibility of the files provided by the Engineer with fabrication computer controlled cutting machinery is the responsibility of the Contractor.

C. Shape. Manufacturer of decorative panels should work with pedestrian rail Fabricator and Contractor to verify exact shape of panels. Panels are approximately rectangular, but it is the Contractor's responsibility to ensure communication between all parties concerning the exact shape and corner angles of the panels. Fabricate the panels to match the geometry of the pedestrian railing at each panel location along the stations of the bridge.

4.0 FABRICATION. Materials and workmanship shall be in accordance with the KYTC Standard Specifications; AASHTO/AWS D1.5M/D1.5 "Bridge Welding Code"; AWS D1.1/D1.1M "Structural Welding Code – Steel"; AASHTO "LRFD Bridge Design Specifications", 6th Edition (AASHTO LRFD Design); AASHTO "LRFD Bridge Construction Specifications", 3rd Edition, 2010 (AASHTO LRFD Construction); the Contract Documents; and this Special Provision.

Upon completion, the machined plate shall be galvanized per ASTM A123.

5.0 SAMPLING, TESTING & INSPECTION. Submit one completed full-size panel with connection hardware as a sample panel to the Engineer for approval prior to fabricating additional panels. Upon approval of the Engineer, the panel may be used as a production panel.

Shop Inspection. The engineer reserves the right to visit the manufacturer's fabrication shop for purposes of inspecting the manufacturing, assembly, testing and galvanizing of the decorative panels.

6.0 IDENTIFICATION, SHIPPING & HANDLING. Identify the station of the panel on the shop drawing to aid in proper field installation.

7.0 INSTALLATION. Installation of the panels shall be to the lines and grades shown on the plans and in accordance with the Pedestrian Railing plans, notes and details.

Test fit the first Decorative Panel in place on the first length of installed Pedestrian Railing prior to the installation of any other railing sections. Verify to the satisfaction of the Engineer that the panel is in plane and the respective edges are parallel to both railing posts and roadway slope.

8.0 SUBMITTALS. Submit shop drawings for the decorative panel. Shop drawings shall include, but not be limited to, the following:

- A. Layout of pedestrian railing showing location and dimensions of all decorative and railing panel lengths with station locations for decorative panels.
- B. Complete details of all components and sections showing all materials used.
- C. A listing of all applicable KYTC, ASTM and AASHTO specifications.
- D. Name and address of the fabricator and location of the fabrication plant.
- E. Name and telephone number of the fabricator's representative who will be responsible for coordination of production, inspection, sampling and testing.
- F. Cutting procedures used in the fabrication clearly described and detailed
- G. Welding procedures used in the fabrication clearly described and detailed.
- H. Table of image type, station, grade, angle of panel corners for each panel.
- I. Connection detail for bolting the Decorative Fence Panels to the stiles and rails of the Pedestrian Railing.
- J. Touch up procedures for galvanized finish scratched during shipping or handling.

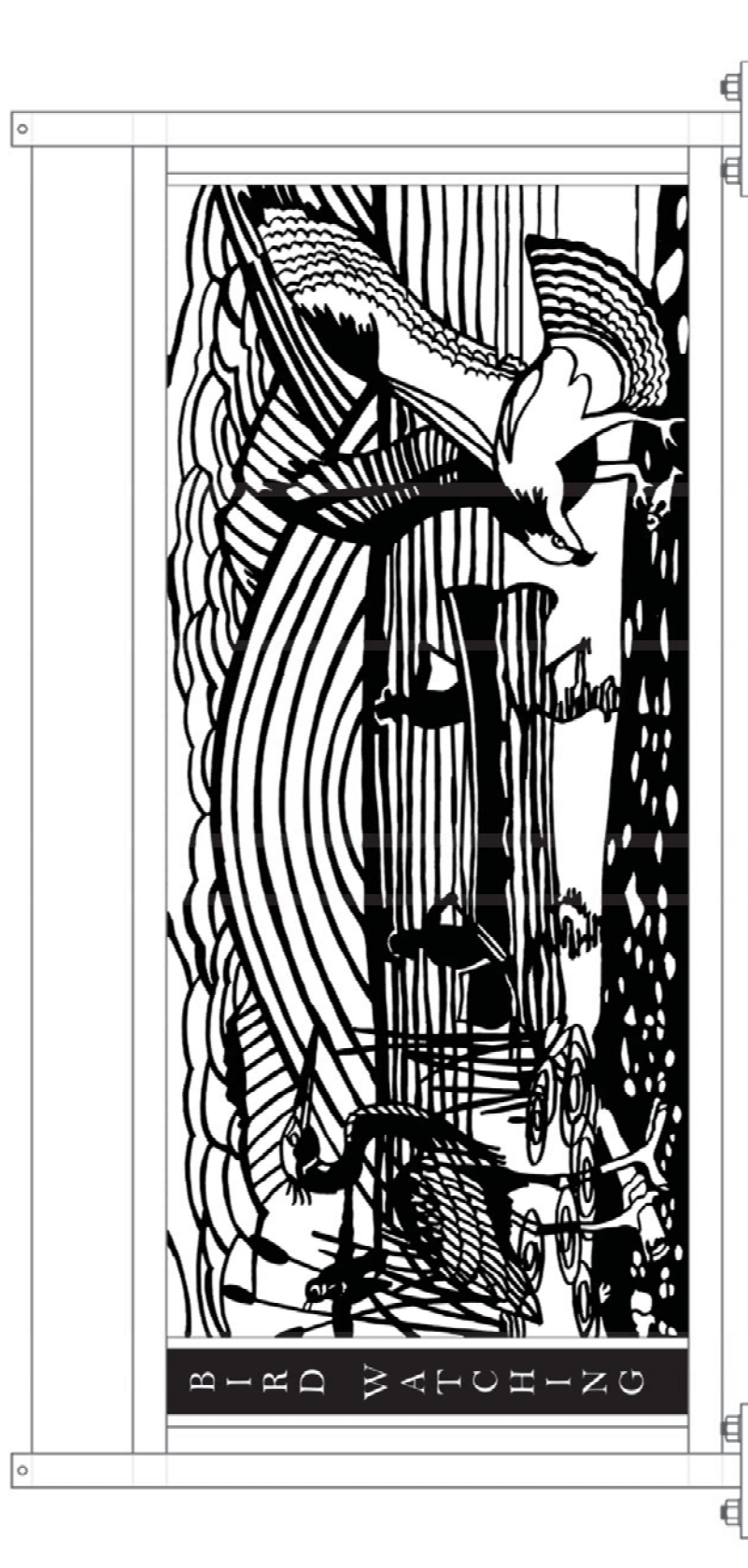
Decorative Fence Panel shop drawings and Pedestrian Railing shop drawings shall be coordinated to ensure fit when field assembled. Do not perform any fabrication until the approved shop drawings are in the hands of the Inspector, panel Manufacturer and railing Fabricator, and the Engineer has authorized fabrication.

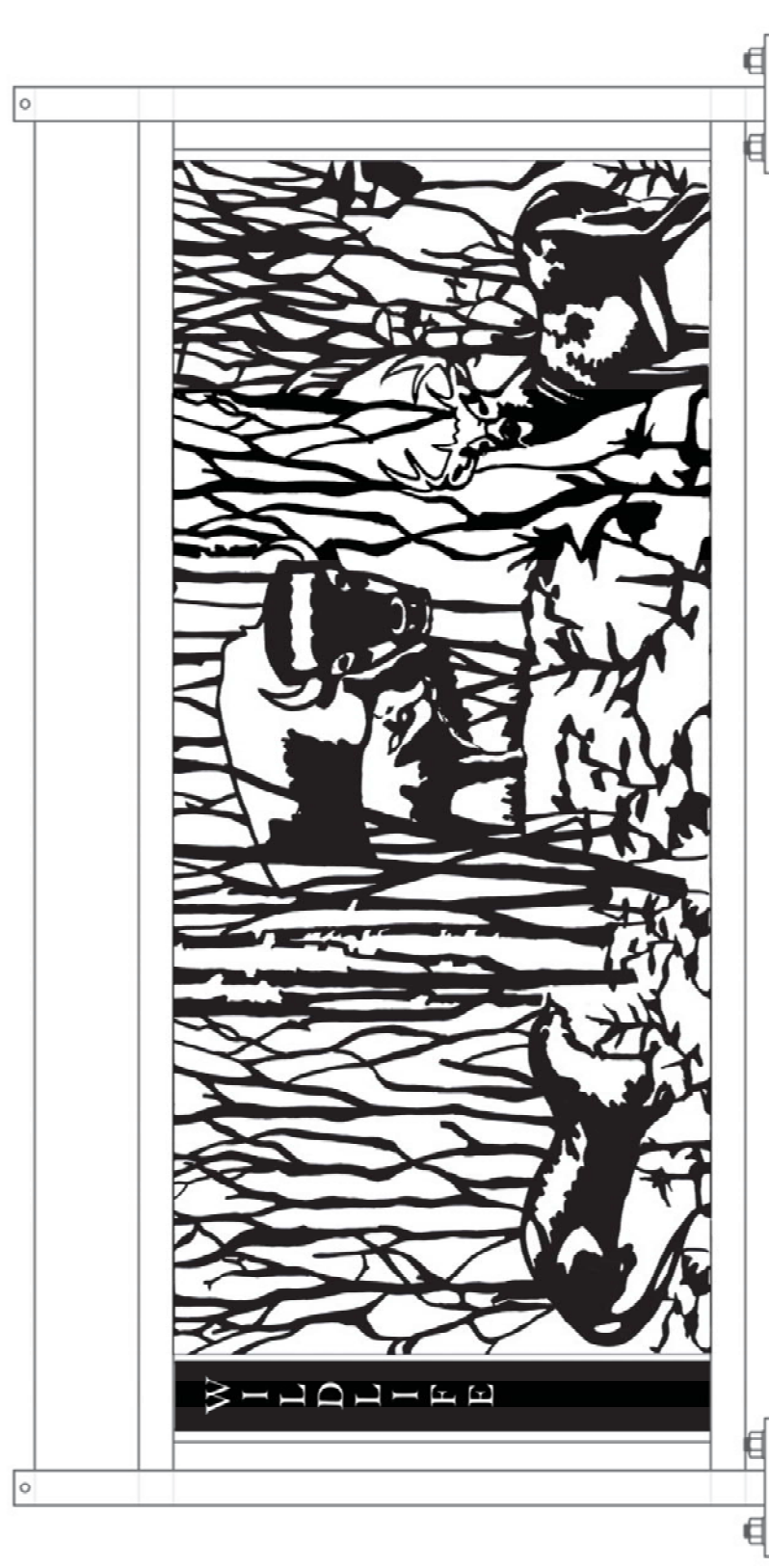
9.0 MEASUREMENT. The Department will measure the quantity by each individual unit.

10.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

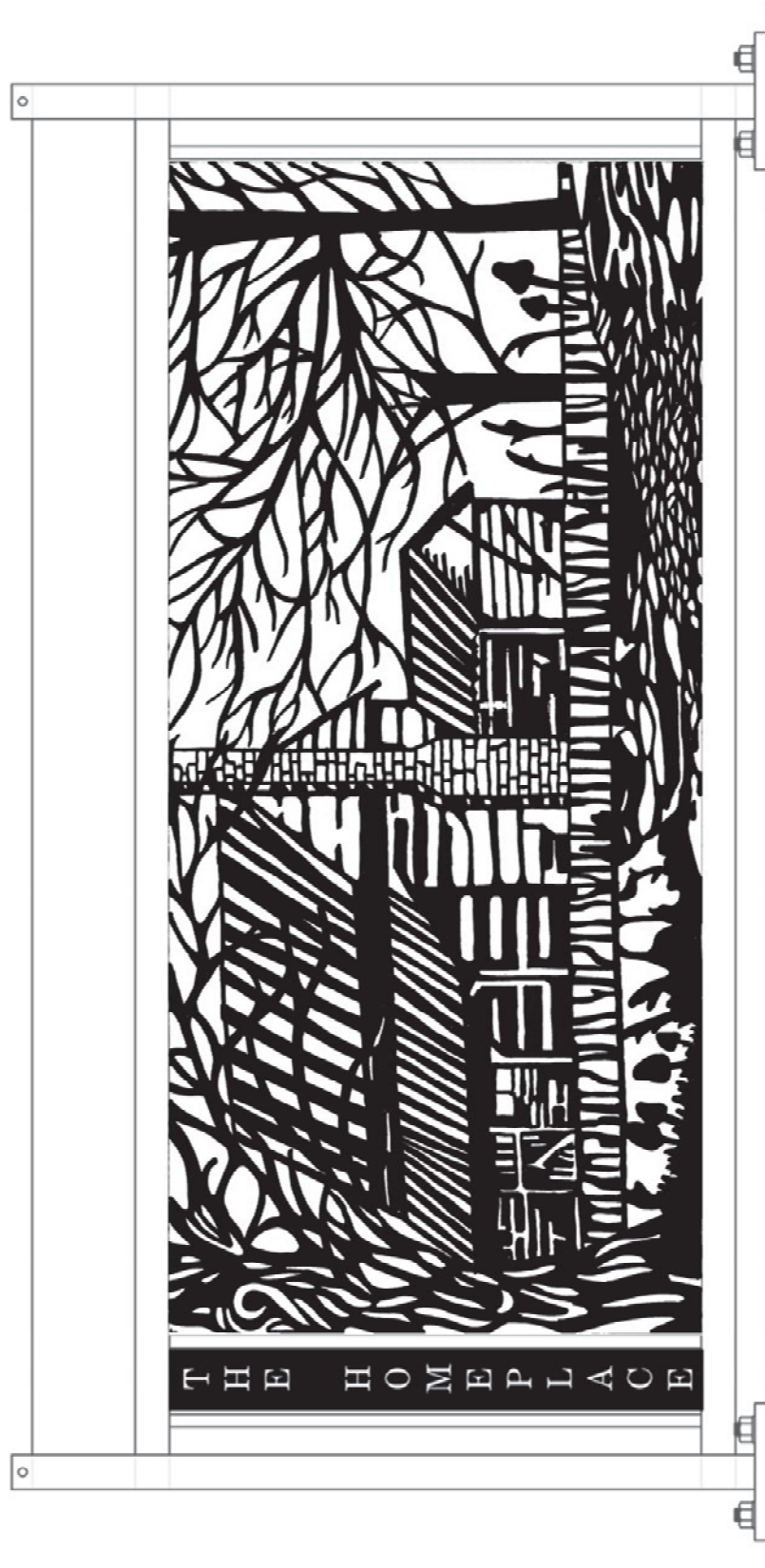
<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24629EC	DECORATIVE FENCE PANEL	EACH

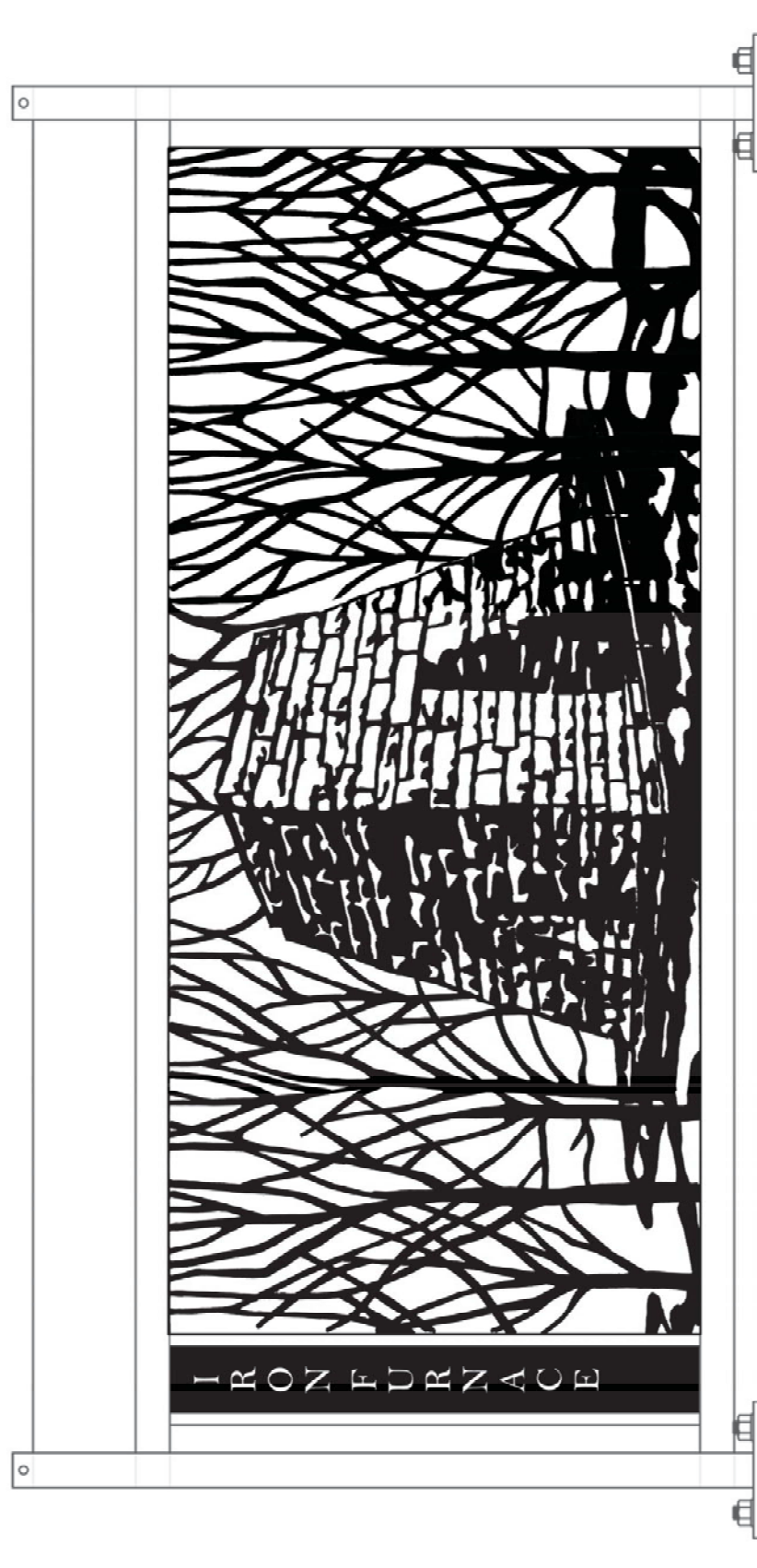
The Department will consider payment as full compensation for all work required under this section.

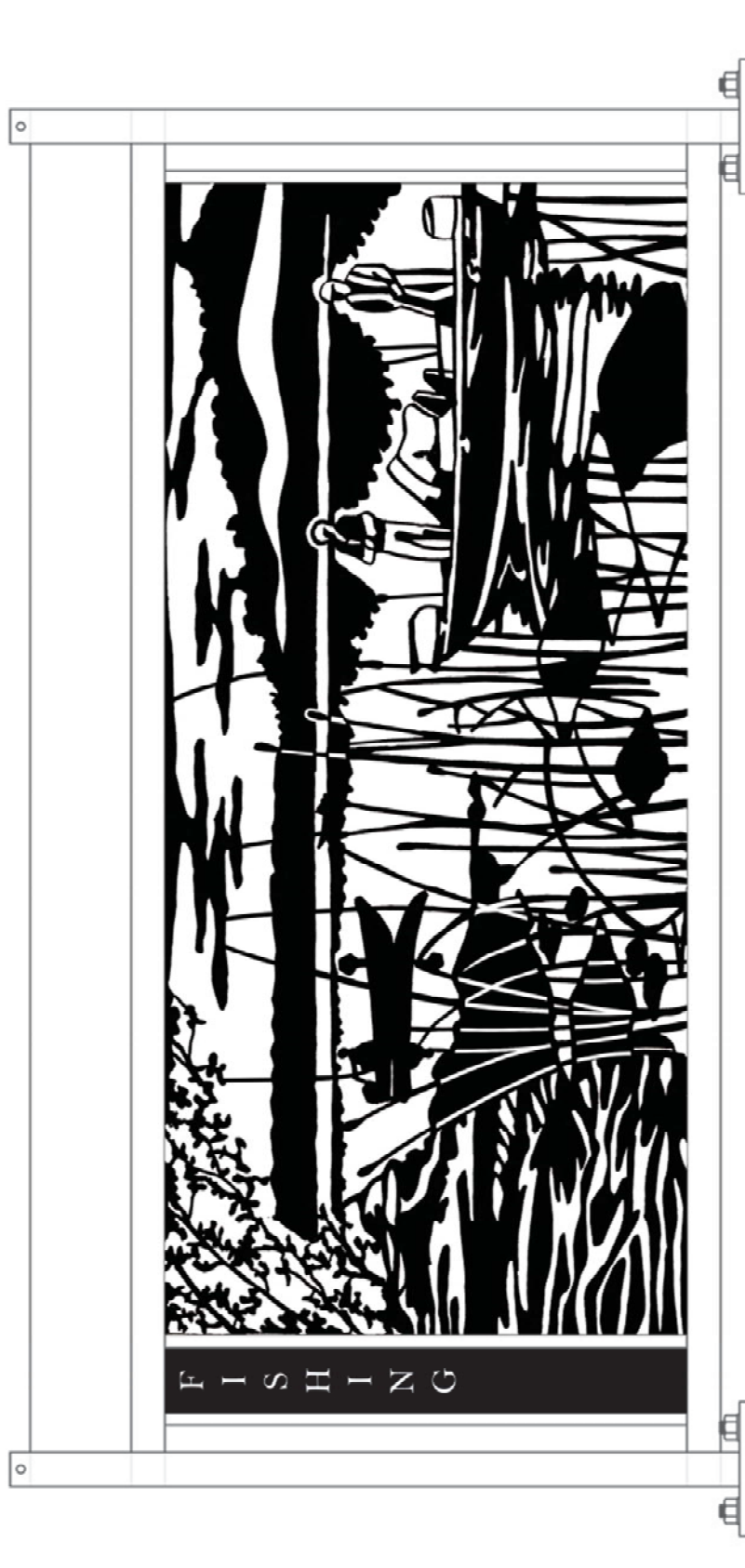


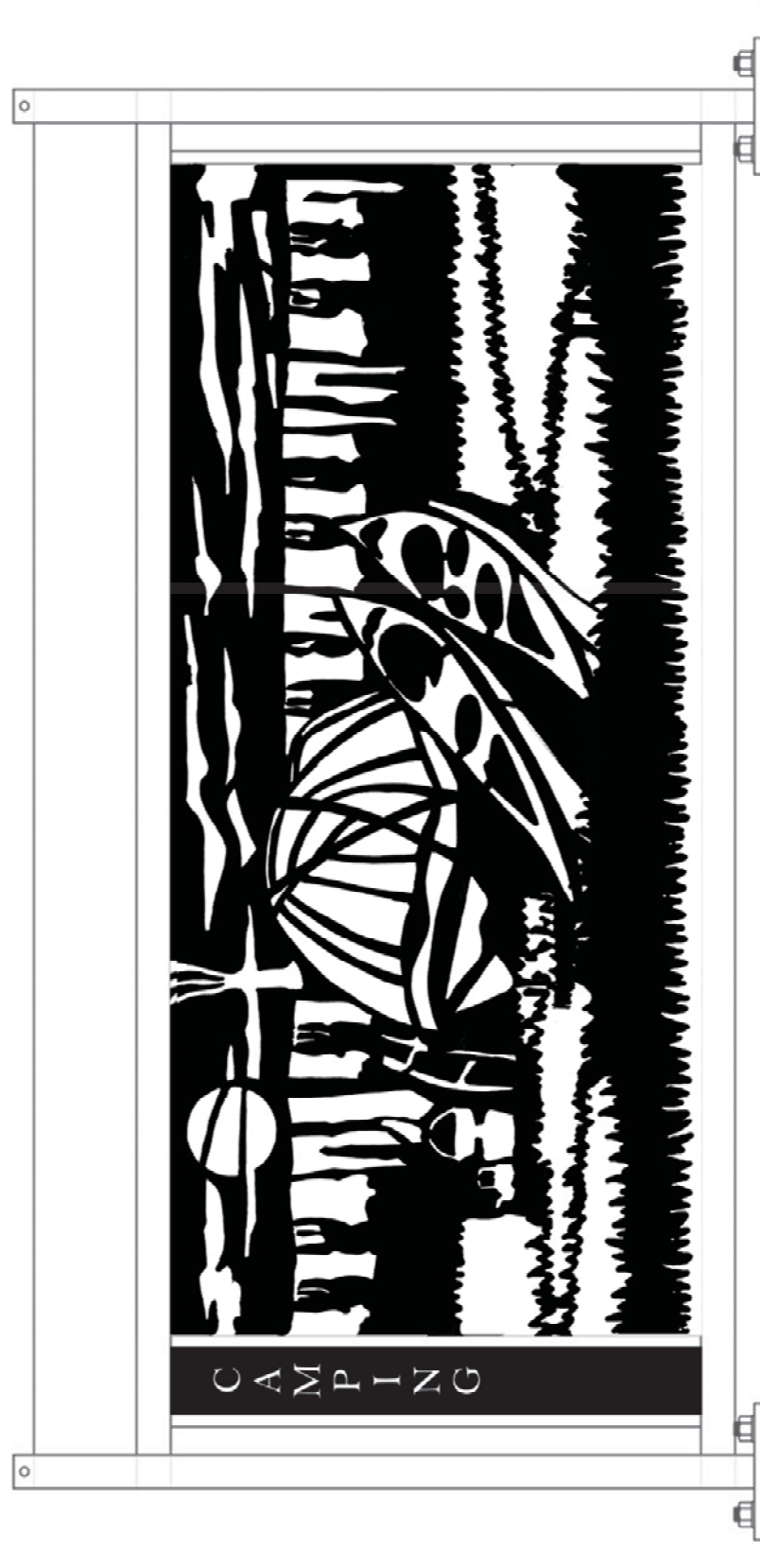












SPECIAL NOTE FOR INSTALL - DUCT BANK

Trigg County
US 68/KY80 Bridge over Lake Barkley

1.0 DESCRIPTION AND SCOPE OF WORK

- 1.1 Perform all work in accordance with the Kentucky Transportation Cabinet, Department of Highways 2012 *Standard Specifications for Road and Bridge Construction* and applicable Supplemental Specifications, the Standard Drawings, and this Note. Section references are to the *Standard Specifications* unless noted otherwise.
- 1.2 This work shall apply to the Approach Spans and Arch Span and include the furnishing (except where noted otherwise) and installation of duct banks, pull boxes, hanger supports, utility platforms and ground pull box vaults along or in the vicinity of the bridge, in accordance with the plans, specifications and this special note. At a minimum this includes:
 - 1.2.1 Installing two 4-in. diameter XHW fiberglass conduits (furnished by Contractor) and two 1 ½-in. diameter inner ducts (furnished by AT&T) in each 4" conduit, collectively known as "AT&T Duct Bank."
 - 1.2.2 Installing four 4-in. diameter XHW fiberglass conduits (furnished by Contractor), collectively known as "PRECC Duct Bank."
 - 1.2.3 Furnishing and installing fiberglass plates, wind support cable bracing, threaded rod hanger system, all connectors and other related fittings, as detailed in the Plans, or as otherwise required for installation of AT&T Duct Bank and PRECC Duct Bank.
 - 1.2.4 Furnishing and installing pull boxes with padlocks along the bridge at the locations shown in the Plans for both AT&T Duct Bank and PRECC Duct Bank.
 - 1.2.5 Designing, furnishing materials and installing grated utility platforms at all pull box locations.
 - 1.2.6 Installing two ground pull box vaults (furnished by PRECC), one at each end of the bridge. The approximate size of the vaults will be 8' x 4' x 4' deep. The vaults shall be located at the top of the slope behind the guardrail and installed flush with the final grade. The four PRECC 4-in. diameter XHW fiberglass conduits shall terminate at either end within the boxes.
 - 1.2.7 Installing two ground pull box vaults (furnished by AT&T), one at each end of the bridge. The vaults shall be located at the top of the slope behind the guardrail and installed flush with the final grade. The two AT&T 4-in. diameter XHW fiberglass conduits shall terminate at either end within the boxes.

2.0 GENERAL

Pull box dimensions shall be in accordance with the Plans and *Standard Specifications* and must satisfy requirements of the National Electrical Safety Code (NESC.) Pull boxes shall have locking mechanisms and weather-resistant padlocks. Padlocks shall be keyed differently for AT&T Duct Bank and PRECC Duct Bank and shall include a minimum of four identical keys for each.

The number and diameter of ducts for each Duct Bank shall comply with the Plans and Section 1.0 of this Note. Duct material shall be in accordance with Section 4.0 of this Note.

Grated utility platforms shall conform to the Plans and the material specifications in Sect. 4.0 of this Note.

Utility support channels shall conform to the Plans and be spaced no greater than 16'-6" along the bridge.

Installation of fiber optic cables and electric lines will be by others.

3.0 DESIGN

3.1 The Contractor shall design the grated utility platforms and their components, including hatches, ladders, railings and all connections. All design documents shall be prepared and stamped by a Professional Engineer licensed in the Commonwealth of Kentucky. Design calculations and shop drawings shall be submitted to the Engineer for review and approval. The shop drawings shall include all member sizes, connection details and materials specifications.

The Contractor shall receive Engineer's approval prior to purchasing any materials or equipment for the platform system.

3.2 Shop drawings for the duct bank and hanger systems and the pull boxes shall be submitted to the Engineer for review and approval. The shop drawings shall include all member sizes, connection details and materials specifications.

4.0 MATERIALS

4.1 All materials shall comply with the Plans, *Standard Specifications* and this Special Note. Where material or component properties are not adequately identified or described, they shall comply with AASHTO *LRFD Bridge Construction Specifications*, 3rd Ed., 2012 Interims.

4.2 Utility Conduit. 4-in. diameter conduit shall comply with NEMA TC 14-2002 and 2011 NEC Article 355. Fire resistance and water tightness of the conduit shall

meet or exceed UL 2515A. The inner surface shall be smooth. Wall thickness shall be 1/4" and conduit shall be capable of spanning 16'-6" with a cable load of 14 pounds per lineal foot with a maximum deflection of 5/8".

- 4.3 Structural Steel. Structural steel for grated utility platforms, ladders, hatches and handrails shall meet the physical requirements of ASTM A709, Grade 50. Members shall be painted in compliance with the *Standard Specifications* to match the steel bridge girders. All hardware and fasteners for access hatches shall be stainless steel, Type 316.
- 4.4 Threaded Rod. 3/4" threaded hanger rods shall be ASTM A709, Grade 36, and hot-dipped galvanized in accordance with AASHTO M232 after fabrication.
- 4.5 Bolts, Nuts & Washers. Except where connected to stainless steel cable bracing or platform access hatches, the bolts, nuts and washers shall be in accordance with ASTM F1554 Grade 36, ASTM A563 Grade A, and ASTM F436, respectively, and shall be hot-dipped galvanized.
- 4.6 Wind Support Cable Bracing. 1/8" cable bracing shall be stainless steel aircraft cable (7 x 19) complying with ASTM A492, Type 304. Bolts, nuts, washers and other hardware in contact with cable shall be Type 316 stainless steel complying with ASTM A276, unless shown otherwise in the Plans.

5.0 INSTALLATION

Installation of duct banks, duct bank support system, utility platforms and pull boxes shall comply with the Contract Plans, Standard Specifications, this Special Note and the approved calculations and shop drawings. Installation of ground pull box vaults shall be coordinated with the utility companies. Fabrication and installation shall not commence until all relevant calculations and shop drawings have been submitted and have been reviewed and accepted by the Engineer.

Guidelines for Installing Expansion Joints

Install expansion joints between securely mounted items such as pull boxes or other conduit terminations as follows, unless noted otherwise on the plans:

- For conduit length less than 50 ft., no expansion joint is required.
- For conduit length between 50 ft. and 200 ft., install one expansion joint mid-way.
- For conduit length over 200 ft., install one expansion joint every 200 ft. with the first expansion joint no more than 100 ft. from the end termination.
- If more than one expansion joint is installed within a conduit length (i.e., greater than 200 ft.), split anchor rings shall be installed around the hanger that is closest to mid-way between each expansion joint. The hangers that have split anchor rings shall be braced.

6.0 MEASUREMENT

This work will be measured on a linear feet of duct bank basis between back face of the end bents. The work to terminate the duct banks at the ground pull box vaults will not be measured.

7.0 PAYMENT

Payment at the contract unit price shall include the cost of all labor, supervision, material (except that furnished by the utility companies) and equipment to complete the work in accordance with the Plans and Specifications.

The cost of installing inner duct (to be furnished by AT&T) into the AT&T duct bank shall be included in the cost of this item.

The cost of furnishing and installing the duct bank support assemblies including bracing cable and connection hardware, and utility platforms, including pull boxes, access hatches and ladders shall be included in the cost of this item.

The cost of all labor, material and equipment to terminate the duct banks at the ground pull box vaults (to be furnished by the utility companies) shall be included in the cost of this item.. Apportion the work equitably between the AT&T Duct Bank and PRECC Duct Bank pay items on a lineal per foot basis.

Payment will be made under:

<u>BID ITEM CODE</u>		
24617EC	INSTALL –DUCT BANK(AT&T)	LF
24617EC	INSTALL –DUCT BANK (PRECC)	LF

The Department will consider payment as full compensation for all work required by this note.

SPECIAL NOTE FOR SHOP DRAWINGS AND WELDING PROCEDURES

This Special Note replaces Subsection 607.03.01 of the Department's 2012 Standard Specifications for Road and Bridge Construction in its entirety.

607.03.01 Shop Drawings and Welding Procedures. Submit detailed shop drawings and welding procedures to the Division of Structural Design or their designated representative (“Reviewer”). The Department will furnish plans showing sufficient details for the Contractor to prepare detailed shop drawings. Include welding procedures and details, when required, as part of the shop drawings. The Department will not consider the shop drawing submittal process to be complete without the submittal of welding procedures.

Submit a shop drawing submittal schedule (Schedule) for review and approval no later than thirty calendar days prior to the first submittal. List all anticipated shop drawing packages for the project by component and superstructure unit, span or pier, and show the estimated submittal dates for each package. Update the Schedule and resubmit to the Engineer, for review but not approval, on the first day of each calendar month until all required shop drawing submittals have been approved.

Submit shop drawings in substantial conformance with the latest Schedule submitted to the Engineer, and include all relevant drawings and construction procedures necessary for a thorough review. Allow sufficient lead time to permit a complete review.

Submit shop drawings in electronic format. Make all drawing submittals in a 22 inch by 36 inch Portable Document Format (PDF) that will produce clear prints and sharp lines on both 11 inch by 17 inch prints and 22 inch by 36 inch prints (“PDF Prints”). The Department reserves the right to require hard copy prints on a case-by-case basis.

Submission of two or three-dimensional computer modeling data will not by itself constitute a complete shop drawing submittal. The use of two- or three-dimensional computer modeling techniques to facilitate fabrication will not relieve the fabricator from providing detailed shop drawings of all bridge members and components for the Department's records.

Submit to the Reviewer PDF Print Files of the detailed shop drawings and welding procedures. Electronically stamp all shop drawings and procedures with the Contractor’s stamp as an acknowledgment that the Contractor has reviewed the submittal for completeness and appropriateness. Each sheet will be electronically stamped by the Reviewer. The Reviewer will return one PDF file of reviewed shop drawings with all required corrections noted. When corrections and resubmittal are required, submit PDF Print Files of the corrected drawings. After the final review, when additional resubmittal is unnecessary, the Reviewer will forward the reviewed shop drawing PDF Print files with the Reviewer’s Stamp indicating approval (or conditional approval) and any final comments to the DOSD Shop Plan Coordinator for distribution. Only plans submitted directly to the Shop Plan Coordinator by the Reviewer will be distributed, and only plans electronically stamped “distributed by the Division of Structural Design” are to be used for fabrication.

After fabrication is complete and the Engineer has approved the structural steel for shipment, furnish to the Engineer one electronic set of the as-built shop drawings, including the welding procedures, as PDF Prints.

Review cycles will begin the first Business Day after a submittal is received (“logged”), or the next Business Day after the submittal date indicated on the most recently submitted Schedule, whichever occurs later. Submittals received after 2:00 PM Eastern Time will be

logged as the next Business Day following receipt of the submission. 'Business Days' are weekdays, Monday through Friday except official Department holidays.

The Reviewer will determine if all relevant drawings and construction procedures have been submitted. If a submission is incomplete or otherwise requires additional information or data to properly complete the review, the review cycle for the submission will be reset and the cycle will begin as specified in the previous paragraph once all required information is received (logged.)

Review cycle durations for shop drawing submittal packages deemed complete by the Reviewer are as follows:

- Allow at minimum 30 Business Days for review of shop drawing submissions of welded plate girders or rolled steel sections.
- Allow at minimum 30 Business Days for review of shop drawing submissions for the tied arch rib, tie girder, knuckle, hanger anchors, isolation bearings, dampers and floor beams.
- Allow at minimum 15 Business Days for review of other shop drawing packages.

No claims for delay will be considered for shop drawing reviews when the Engineer has indicated that relevant drawings or construction procedures are insufficient for a thorough review. No claims for delay will be considered for shop drawing reviews when information relevant to the submittal review is still in the process of being developed. Additional time to review requested changes to any relevant drawings and construction procedures will not be considered cause for delay claims.

Do not make changes to any drawing after the Engineer has reviewed it without the Engineer's written approval or written direction.

Only make substitutions of sections different from those shown on the drawings when the Engineer approves in writing.

Although the drawings may have been reviewed, take responsibility for the correctness of the drawings and for shop fits and field connections.

Take responsibility for any material ordered or work done before the Engineer reviews the drawings and welding procedures.

When design drawings differ from the shop drawings, the design drawings govern. When the requirements of this section differ from the shop drawings, the requirements of this section govern.

When the design drawings differ from the requirements of this section, the design drawings govern.

SPECIAL NOTE FOR HELPER BOAT

1.0 SCOPE OF WORK. Bidders are advised that there is commercial barge traffic on this portion of Lake Barkley throughout the year.

The work described in this special note is to provide a helper boat with pilot to assist commercial tows upon request by commercial barge pilots transiting under the bridge.

Requests for a helper boat will be at the discretion of the commercial barge pilot transiting the bridge on the navigable waterway.

2.0 EQUIPMENT. The equivalent utility of an 1800 horsepower (1800 HP) tow boat shall be provided. When not servicing requests from transiting Commercial Barge Pilots, the helper boat may be used by the Contractor for other construction activities, but shall be made available to assist tows when requested without delay to the needs of commercial navigation.

During the phases of work listed in Section 5.0 herein, the helper boat will be moored or docked on-site or within one mile of the project site at all times except when in use as a helper boat or assisting construction activities.

3.0 PERSONNEL. The pilot of the helper boat shall have and maintain a Transportation Worker Identification Card (TWIC) and the Merchant Mariner Credential (MMC) for the Pilot of a Towing Vessel appropriate for the class and size of tow boat being operated as a helper boat. One or more relief pilots with the same credentials as listed above shall also be retained by the Contractor such that 24 hours a day, during instances when a helper boat is an active requirement, a qualified and licensed pilot is always available to operate the helper boat.

4.0 REQUIREMENTS. The United States Coast Guard (USCG or Coast Guard) regulates all work on or in navigable waters. Comply with all permit conditions and Coast Guard regulations.

Provide regular advance notifications in writing to the Engineer of upcoming work activities on the lake for forwarding to the USCG and the United States Army Corps of Engineers (USACE) for the agencies' issuance as Notices to Mariners.

Three months prior to the first instance of work requiring a helper boat to be active, the Contractor shall submit to the Engineer for approval the Chain of Communication by which the Commercial Industry will contact the Contractor's Helper Boat Pilot for requesting assistance in transiting the bridge site.

Two months prior to the first instance of work requiring a helper boat, the Contractor shall participate in a meeting with the Department, the USCG, and representatives of the commercial towing industry for the purpose of advance coordination and safety preparation.

5.0 INSTANCES REQUIRING HELPER BOAT. (Note: All references to pier and span identifiers for both the existing Henry R. Lawrence Memorial Bridge and the Proposed new bridge conform to the Contract Drawings.)

The existing navigation channel span of the Lawrence Bridge is designated as Existing Span No. 2 (Span No. 2 is the eastern-most arch span over the "Existing Sailing Line" designated in the plan, and also referenced as the "Right Descending Span.")

Provide a helper boat upon request of the Pilot of any Commercial Towing Vessel transiting the site when any work activity results in reduction to the horizontal navigation channel defined by the clearances for Existing Span No. 2 projection parallel to the sailing line.

Construction of Proposed Pier 8 foundation shafts, footing and pier are example activities anticipated to encroach into the navigation channel and result in reduction to the horizontal navigation clearance in Existing Span No. 2. Other construction and/or demolition operations which encroach into the navigation channel defined by Existing Span No. 2 will also require the Contractor provide a helper boat, upon request of a Pilot.

Do not rely on Existing Span No. 3 to be an alternate span for Commercial Towing Vessel transiting the site.

6.0 DEMOBILIZATION OF HELPER BOAT. Submit to the Engineer a request in writing to discontinue the Helper Boat service certifying that there will be no subsequent Contractor operations or instances requiring a helper boat. Do not demobilize the Helper Boat until authorized in writing by the Engineer.

7.0 RECOVERY OF DAMAGES. In the event that any damages to the Department, to the public, or to commercial towing interests result from the Contractor's failure to provide a helper boat when requested during the instances requiring a helper boat as described above, such damages will be the responsibility of the Contractor. The Department will seek recovery from the Contractor of any and all damages resulting from failure to provide a helper boat in accordance with this special note.

8.0 MEASUREMENT.

When Helper Boat is included in the Bid Proposal as a separate bid item, the Department will measure all work performed as part of providing a Helper Boat as a lump sum.

9.0 PAYMENT.

The Department will pay for the quantities at the contract unit price as follows.

When Helper Boat is included in the Bid Proposal as a separate bid item, the Department will make partial payments for Helper Boat in 4 equal or approximately equal payments.

- 1) 25 percent after the Helper Boat has assisted ten (10) Commercial Tows at the request of the Commercial Tow Pilots transiting the bridge, or with Payment 2, whichever comes first.
- 2) 25 percent when all proposed concrete bridge pier construction is complete.
- 3) 25 percent when the proposed bridge is substantially complete and has been opened to traffic.
- 4) 25 percent after removal of the existing Lawrence Memorial Bridge Channel Piers and Spans and after the Helper Boat has been authorized in writing by the Engineer to be demobilized.

The Department will consider payment as full compensation for all work required under this section. Payment will be made under:

BID ITEM CODE

24620EC	HELPER BOAT	LS
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SPECIAL NOTE FOR REMOVAL OF EXISTING BRIDGE

1.0 DESCRIPTION. The Contractor shall remove the existing Henry R. Lawrence Memorial Bridge structure, the “Existing Bridge”, to the limits indicated on the plans and in accordance with KYTC Standard Specification Section 203 “Removal of Structures and Obstructions” and this special note. Where a conflict exists between this special note and Section 203, the provisions in this special note shall govern.

2.0 CONSTRUCTION. Special conditions within the project permits relate to demolition and removal of the Existing Bridge. Comply with the conditions stated in all permits. Bridge decks are a habitat of the Grey Bat. Perform demolition of the bridge deck between November 15th and March 15th of the same winter season. See also the Roadway Plans, Special Notes, Mitigation of Impacts to Threatened/Endangered Species.

Take ownership and dispose of all materials removed.

The representation of existing bridge on plan sheets is for information only. The contractor is referred to the existing bridge plans to determine approximate quantities for removal.

The contractor is responsible for location and protection of all existing utilities.

The development of the demolition plan and procedures is the responsibility of the contractor. The demolition plan shall clearly demonstrate the safety and feasibility of all proposed operations. All submittal components must be sealed by a professional engineer licensed in the Commonwealth of Kentucky.

Obtain all necessary licenses, training and permits for the handling of and use of explosives, if used.

Blasting of superstructure steel truss spans with explosives will be acceptable to the Department with prior approval, except as prohibited by the permits. Any proposed blasting operations shall be in accordance with Section 112.03.09 of the Standard specifications and shall be detailed in the demolition plan and procedures. The Department reserves the right to specify hours during the day when blasting is not allowed.

The use of explosives under water may or may not be acceptable to all governing agencies. The Contractor shall obtain all necessary permits, licenses, certifications, etc., for use of explosives. The Contractor shall contact the appropriate governing agencies prior to the use of explosives and provide confirmation to the Department that the necessary permits, licenses, certifications, etc., have been obtained.

Submit the demolition plan to the Engineer six months prior to scheduled demolition.

The Engineer will coordinate submission to the United States Coast Guard (USCG.) Do not proceed with demolition until the Engineer has received written acceptance of the demolition plan from USCG. Do not proceed with demolition until authorized by the Engineer.

Schedule the removal of those trusses and piers obstructing the navigation channel as the first activities to occur. This is not intended to preclude the Contractor from also working at other locations simultaneously.

Maintain a detailed schedule of the entire removal and demolition sequence. Submit the schedule to the Engineer two months prior to the start of demolition work and thereafter as changes are made. The Engineer will coordinate with USCG and USACE to notify mariners for the demolition operations as scheduled.

Prepare plans for protection of traffic during demolition and removal activities; including vehicular, pedestrian, bicycle, commercial vessels and recreational boater traffic. Traffic will not be allowed on the replacement bridge during blasting or during other events that pose potential threat to the safety of the public, as determined by the Engineer.

Maintain navigation and obstruction lighting on the existing bridge, or remaining portions thereof, in accordance with all USCG requirements. Install markings/buoys consistent with USCG requirements for items below water.

Coordinate temporary access to the work site with the Department. The Contractor may construct pile supported temporary docks only as approved by the Engineer. The construction of a temporary causeway into the lake for purposes of existing structure removal will not be permitted. The Contractor is not permitted to place fill material in the lake for any reason.

Coordinate temporary construction ingress/egress from US68/KY80 with the Department. Superstructure concrete deck shall be removed prior to removing any structural steel members. Take necessary measures to prevent any debris from falling into the water. The Contractor is responsible for removal of all materials from the water, to the satisfaction of the Engineer.

Conduct a preconstruction survey of the lake bottom to establish any materials existing prior to construction or demolition. Conduct a post demolition survey of the lake bottom to verify all materials from construction and demolition have been removed. Provide the report of all surveys to the Engineer. The USACE Navigation Branch will also conduct a post-demolition sweep survey. The Contractor shall be responsible to remove all materials identified by the USACE Navigation Branch after the post-demolition sweep survey.

Remove all piers down to the mudline elevation.

Fill cavities left by the end bent structure removal using approved, similar causeway materials. Grade to blend with adjacent contours of the existing causeway.

3.0 MEASUREMENT. The Department will measure all work performed as part of Removing the Existing Bridge as a lump sum.

4.0 PAYMENT. The Department will consider payment as full compensation for all work required under this section.

Payment will be made under:

<u>BID ITEM CODE</u>		
02731	REMOVE STRUCTURE	LS

SPECIAL NOTE FOR CONSTRUCTION TRAILER

1.0 DESCRIPTION. A construction trailer shall be provided and maintained for the exclusive use of the Engineer/Project Manager and their staff for the duration of this project. The duration of the project shall be defined as the period between the occupancy date defined in Section 2.3 herein and the later of the completion date in this proposal or the actual completion date when all requirements of the Contract Documents have been fulfilled. All costs associated with Federal, State, and Local regulatory permits and inspections, and setup/removal of the construction trailer shall be that of the Contractor.

The construction trailer shall be weatherproof, wind-tight, and dust-proof with level and solid floors. The contractor is to retain ownership of this construction trailer and be responsible for its removal upon completion of the project.

2.0 REQUIREMENTS.

2.1 Location. The construction trailer shall be located on a site that is mutually agreed to by the Engineer/Project Manager and the Contractor in a location that is convenient to the site and will not affect progression of work.

The construction trailer may be a trailer or a permanent building and shall be in accordance with applicable state and local codes and KYOSHA/OSHA requirements.

2.2 Minimum Requirements. The construction trailer shall be a minimum of 720 sq. ft. with an 8 ft. minimum height from the floor to the ceiling. This construction trailer shall have at least two doors. At least one of the doors must be able to be locked from the inside, and the locks shall be keyed the same for all doors. Five key sets to the office shall be furnished by the Contractor. There shall be a minimum of 8 windows that are at least 5 sq. ft. each. Windows shall be equipped with screens and approved locking mechanisms and shall be sliding or hinged. Windows shall also be provided with approved coverings.

The construction trailer shall have a minimum of two offices (120 sq. ft. each) with inside doors and an area large enough to accommodate jobsite meetings for KYTC personnel, Contractor/Sub-Contractor personnel and Vendors.

2.3 Other Requirements. The construction trailer that is provided for the use of the Engineer/Project Manager shall be fully furnished and ready for occupancy at least two days prior to the start of actual construction.

The Contractor shall be responsible for protecting the construction trailer from fire, flooding, and theft throughout the duration of the project. If there is any loss of property to KYTC due to theft, fire, or natural disaster, it shall be the responsibility of the Contractor.

The construction trailer shall have cooling/heating capabilities to maintain a uniform temperature between 68°F and 80°F.

The electrical system for the construction trailer shall be 100 amp minimum with 120/240 volt electrical service. The construction trailer shall be furnished with a minimum of two two-prong receptacles in each office, storage room and meeting area to accommodate all required electrical equipment.

The Contractor shall be responsible for regular weekly trash disposal for the construction trailer.

The construction trailer shall have sufficient parking to accommodate KYTC personnel regularly assigned to the project location and their agents and visitors with a compacted aggregate or paved parking lot. The Contractor shall furnish security lighting for the parking area.

The construction trailer shall have a minimum of one separate, lockable indoor storage area, (minimum 100 sq. ft.) to adequately store equipment (e.g., nuclear density gauge, cylinder molds, concrete testing equipment.) This storage building shall have the capacity to secure a nuclear density machine by means of double lock system. This storage area shall have a concrete cylinder tank (minimum 150 gal) that can be maintained at a temperature between 68°F and 80°F.

The Contractor shall be responsible for furnishing an internet connection possible of 1.0 Mb connection speed to the entire construction trailer via wi-fi or a minimum of two wired connections in each office, storage area and meeting area throughout the duration of the project.

The Contractor shall furnish a sign for the construction trailer that distinguishes the office as the KYTC Field Office.

2.4 Field Office Equipment and Supplies.

<u>Description</u>	<u>Quantity</u>
Broom and Dust Pan	1
Coat Rack	1
Toilet Facilities	Yes
Drinking Water (Hot and Cold)	Yes
Cleaning Supplies	Yes
Fire Extinguishers	2
First-Aid Kit	1
Blood Borne Pathogen Kit	1
Smoke Detector	1
Calculator	2
File Cabinets (minimum 4 drawers with locks)	3
Office Desk	4
Office Chairs	4
Folding Table	2
Folding Chairs	12
Drafting Table	1
Drafting Stool	1
Telephone Lines	2
Voice Mail	1
Telephones (One phone shall be cordless with 900 MHz)	3
Shelving	24 lin. ft.
Carbon Monoxide Detector	1
Refrigerator/Freezer	1
Microwave Oven (1.6 cu ft)	1
Waste Paper Baskets	4
Paper Shredder	1

(Minimum 12 sheet capacity with 5 gallon waste basket)	
Three-In-One Copy/Scan/Fax Machine	1
Printer	1
Scanner	1

(The Contractor may provide an all-in-one Copier/Printer/Scanner/fax machine as long as what is provided has the capability to print on plain paper for letter, legal, and 11”x17” sizes and is able to reduce or increase paper size and has an automatic feeder. The paper, toner and ink cartridges shall be provided by the Contractor.)

The construction trailer and all the Equipment and Supplies shall be the responsibility of the Contractor throughout the duration of the contract, and the Contractor will retain ownership at the conclusion of the project.

3.0 MEASUREMENT. The construction trailer will be measured as a lump sum. The payment schedule is to be mutually agreed upon by the contractor and KYTC. KYTC will provide a two-week minimum notice to the Contractor of when the construction trailer will be vacated.

4.0 PAYMENT. The construction trailer will be paid for as a lump sum. All cost associated with the Field Office shall be the responsibility of the Contractor.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
21325ND	CONSTRUCTION TRAILER	LS

SPECIAL NOTE FOR WEB CAMERA CONST MONITORING SYSTEM

1.0 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes an integrated, professional-grade, high resolution digital webcam system designed specifically for the construction industry as a turnkey package including camera(s) and related hardware, mounting equipment, software, wireless cellular data transmission service, website hosting, image hosting and storage, online interface for the system and technical support.

B. Related Sections:

1. Division 1 Section "Photographic Documentation" for periodic construction photographs.
2. Division 1 Section "Closeout Procedures" for submitting digital photographs as Project Record Documents at Project closeout.

1.03 DEFINITIONS

A. CCD: Charge-coupled device.

B. System Vendor: Provider of camera system hardware and software and host maintaining off-site server, data storage devices, and troubleshooting software and equipment. Contractor shall maintain an active contract for System Service for duration of Contract Time unless other term is agreed upon in writing by the Owner. Cost for System Service shall be included in the Contract Sum.

C. System Service: Host services provided by System Vendor including image acquisition, transfer, backup, periodic upgrades to the system, viewing access via a maintained interface on the Internet and on-line storage of images for duration of the Service Contract.

1.04 SUBMITTALS

A. Shop Drawings:

1. Key Plan: Submit key plan of Project site with notation of vantage points marked for location and direction of each camera. Indicate camera mounting heights relative to ground or bridge deck elevation.

- B. Quality Assurance Submittals:
 - 1. Manufacturer's Instructions: Follow manufacturer's installation and testing instructions.
- C. Closeout Submittals:
 - 1. Digital Images: Submit digital still images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - a. Date and Time: Include date and time in filename for each image.
 - b. Format: Submit a sortable/identifiable archive of all digital still images on an external hard drive or DVD format.
 - 2. Time-Lapse "Movie": Compile select digital still images into a time-lapse movie of the construction period. Optimize images included and run-time length of movie to suit Owner's requirements.

1.05 QUALITY ASSURANCE

- A. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 1. Factory assemble camera system from components bearing UL Classification Marking indicating that materials have been produced under UL's Classification and Follow-Up Service.
- B. Comply with NECA 1, "Standard Practices for Good Workmanship in Electrical Construction."
- C. Comply with NFPA 70, "National Electrical Code."
- D. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this Section with minimum five years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels.
- B. Store materials to comply with manufacturer's directions to prevent deterioration from moisture, heat, cold, direct sunlight, or other causes.

1.07 PROJECT CONDITIONS

- A. Environmental Conditions: Capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:
 - 1. Exterior Environment: System components installed in locations exposed to weather shall be rated for continuous operation in ambient

temperatures of minus 10 to plus 120 deg F dry bulb and 20 to 90 percent relative humidity, condensing. Rate for continuous operation when exposed to rain as specified in NEMA 250, winds up to 85 mph. NEMA 250, Type 3R enclosures.

1.08 COORDINATION

- A. Coordinate installation of cameras so that system is fully operational prior to commencement of construction operations.
- B. Coordinate layout and installation of cameras to avoid interference from trees or other obstructions and to prevent sunlight and light from fixtures entering directly into the camera lens.
- C. Coordinate layout and installation of cameras to avoid interference with construction operations.

1.09 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of cameras and equipment related to camera operation that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:
 - 1. Failure of system to meet performance requirements.
 - 2. Faulty operation of hardware and software.
 - 3. Defects in other components of the work.
- B. Warranty Period: Lifetime product warranty required

1.10 USAGE RIGHTS

- A. Obtain and transfer copyright usage rights to Owner for unlimited reproduction of photographs and archives generated by the system.
- B. Contractor shall understand that photographs and archives generated by the camera system become the mutual property of the Owner and System Vendor and cannot be used for advertisement or publicity reasons without the expressed written consent of the Owner and System Vendor.

1.11 MAINTENANCE

- A. Maintenance Service: Provide service and maintenance of camera system for entire Construction period.
 - 1. Examine monthly; clean and adjust equipment.
 - 2. Provide remote emergency repair service by System Vendor 24 hours a day, seven days a week to ensure uninterrupted camera service. Provide personnel on-site to assist System Vendor as needed during working

hours. Provide replacement parts and components due to system failure, damage, or theft within two business days.

3. Maintenance service shall not be assigned or transferred to another agent or subcontractor without prior written consent of Owner.

4. Require system vendor to proactively monitor the system by means of service and maintenance contract. If no connection is made within a span of time not to exceed 24 hours during regular business days, require system vendor to notify Contractor and commence troubleshooting.

a. Provide necessary staff during troubleshooting to verify power availability, to remove and replace system, and to verify functioning phone lines or internet access for dialup and Ethernet based systems.

2.0 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. OxBlue, Inc., 888-849-2583, <http://www.OxBlue.com/>.
2. EarthCam, Inc., 800-327-8422, <http://www.EarthCam.net>

B. Substitutions: As approved by the Owner.

2.02 SYSTEM REQUIREMENTS

A. The indoor/outdoor camera system shall consist of a tamper and impact resistant, discreet, fixed pole or wall-mount enclosure with integrated fixed camera, lens and controller.

B. The cameras shall have the ability to take a high-resolution **8.0 Megapixel** digital still images of the construction site at a set time interval, every 15 minutes, and upload the still images over a wireless cellular modem to a secure, password-protected website.

2.03 EQUIPMENT

A. Camera: Integrated high definition camera and lens assembly consisting of a charge coupled device (CCD) camera with a remotely controlled focal length lens mounted as a permanent module with the following features:

1. Digital Still Image Resolution: Minimum sensor size of **8.0 megapixels**, and at an image resolution of not less than 3264 x 2448 pixels.
2. Memory: Unlimited remote storage provided by the system vendor.
3. Lens: System capable of optical zoom and production of wide angle images to provide sufficient coverage and detail of the construction site as required by the Owner.
4. Focus Mode: iESP auto, Spot AF, Selective AF target, Manual.

5. Metering Mode: Digital iESP multi-pattern auto TTL, Spot metering, Center Weighted metering.
6. Data Connection: Provide one of the following:
 - a. In areas with cellular coverage, operate cameras via built-in cellular data connection provided and maintained by the system vendor.
 - b. In areas without cellular coverage, operate cameras via an RJ-45 Ethernet data connection over broadband or satellite internet access provided and maintained by the Contractor.
7. Electrical Operation: 120 VAC at maximum 83 Watts.

B. Quantity of Cameras: Six (6)

- C. Camera Enclosure: Construct tamper and impact resistant housing of extruded aluminum, die cast aluminum, and sheet aluminum body with factory-applied powder coated finish.
1. Construct with forward opening, front hinged lid, allowing easy access to camera mounting sled.
 2. Provide rear link-lock latch, manufactured from stainless steel, suitable for use with pad lock.
 3. Equip with heater, blower and thermostat.

2.04 INTERFACE AND ONLINE ACCESS

- A. Remote Access: Contractor's System Vendor shall provide an online interface system to allow viewing of all high-definition digital still images captured and stored during construction, from any location with internet access and with password protection.
1. Maintain images on the System Vendor's website for reference available at all times during construction and for not less than 90 days after Final Completion.
- B. Online Interface:
1. The online interface system shall be accessible by an unlimited number of human users.
 2. System shall display Project name and Owner Logo.
 3. The system shall display online time-lapse videos and allow for videos to be downloaded by users.
 4. Navigation: Provide calendar based navigation system for selecting specific images.
 5. Zoom: Provide pan and zoom capability for zooming into high definition images.
 6. User Screen Viewing Options:
 - a. Dynamic Calendar: Provide screen showing calendar in which each day displays an image for that day.
 - b. Project Dashboard: Provide screen allowing user to view multiple sites at one time.

- c. Quad View: Provide screen showing four windows, allowing user to view last four days, weeks, or months on one screen.
 - d. Split Screen: Provide screen showing two discrete images side by side, from same camera or from two different cameras.
 - e. Overlay Mode: Provide screen showing two discrete images overlaid, allowing user to determine differences between the two.
 - f. Full-Screen: Provide screen maximizing view of images on users monitor.
- 7. Email: Provide capability to email photos with comments from within the system.
 - 8. Slideshow: Provide capability to browse through images, moving forward and backward in time by individual image and by day.

3.0 EXECUTION

3.01 PREPARATION

- A. Unpack camera system components and save packing materials (box and foam) for future shipment of camera system including associated appurtenances and mounting equipment to Owner or Manufacturer as required.

3.02 INSTALLATION

- A. General:
 - 1. Install camera system in accordance with manufacturer's printed instructions, State and Municipality codes and requirements and approved submittals. The Owner shall have final approval of all camera locations.
 - 2. Install units plumb and at proper angle to provide maximum field of view of on-site operations.
 - 3. Securely and rigidly anchor products in place.
 - 4. Connect cameras to power.
- B. Location – Cameras shall be located to provide coverage of full project site.
 - 1. One (1) camera shall be located near the western project limit to capture roadway construction.
 - 2. One (1) camera shall be located near the west bank of Lake Barkley to capture roadway and bridge construction.
 - 3. Two (2) cameras shall be located on the existing bridge to capture new bridge construction.
 - 4. One (1) camera shall be located near the east bank of Lake Barkley to capture roadway and bridge construction.
 - 5. One (1) camera shall be located near the eastern project limit to capture roadway construction.
 - 6. The Owner shall have final approval of all camera locations.
- C. Relocate camera as directed by Owner during construction progress.

1. Each camera may be relocated up to two (2) times prior to Final Completion.
2. Camera positions may include attachment to existing construction, new construction and temporary facilities.

D. Position camera so that field of view of approximately 77 degrees covers intended area of site.

1. Install camera at elevation that will provide uncompromised visual coverage.
2. Install camera so that position of sun or man made light sources will not come into direct contact with field of view of camera at any time during construction.

3.03 FIELD QUALITY CONTROL

A. Preinstallation Testing: Test camera on site at ground level prior to mounting unit in its intended elevated position.

1. Contact System Vendor not less than 24 hours in advance of installation for testing.
2. Connect unit.
3. After 30 minutes contact System Vendor and require System Vendor to remotely confirm camera is operating properly.
4. Install cameras in approved locations.

3.04 CLEANING

A. Clean installed items using methods and materials recommended in writing by manufacturer.

B. Clean camera system components, including camera-housing windows, lenses, and monitor screens.

3.05 INSTRUCTION

A. Engage a factory-authorized service representative by phone to instruct Contractors personnel in procedures to adjust and maintain camera equipment.

1. Instruct personnel on procedures and schedules for troubleshooting and maintaining equipment.
2. Explain methods of determining optimum alignment and adjustment of components.

3.06 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance: Maintain camera equipment in good operating condition on a 24-hour basis until removal.

B. Termination and Removal: Remove camera system after Final Completion of the project and with approval from Owner. Complete or, if necessary, restore

permanent construction that may have been delayed because of interference with camera system. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Camera system including associated appurtenances and mounting equipment are property of Owner.

3.07 METHOD OF MEASUREMENT

A. When WEB CAMERA CONST MONITORING SYSTEM is included in the Bid Proposal as a separate bid item, the Department will measure the work performed as part of providing WEB CAMERA CONST MONITORING SYSTEM as a lump sum.

3.08 PAYMENT

A. The Department will pay for the quantities at the contract unit price. When WEB CAMERA CONST MONITORING SYSTEM is included in the Bid Proposal as a separate bid item the Department will make partial payments for WEB CAMERA CONST MONITORING SYSTEM in two (2) equal or approximately equal payments.

1. 50 percent after the system is installed and fully operational.
2. 50 percent after all Closeout Submittals have been submitted and accepted by the Department.

B. The Department will consider payment as full compensation for all work required under this section.

1. Payment will be made under:

<u>Bid Item Code</u>	
23912EC	WEB CAMERA CONST MONITORING SYSTEM LS

END OF SECTION

SPECIAL NOTE FOR CPM SCHEDULING

A. GENERAL. Standard Specifications Section 108.07.04 notwithstanding, contract time extensions will not be given unless the Engineer deems the critical path of the project has been adversely affected. Any contract time extensions will be solely at the discretion of the Engineer. Create the progress schedule required for this project using the critical path method (CPM.) The Contractor shall designate a Schedule Representative who will be responsible for coordinating with the Engineer during the preparation and maintenance of the schedule. The contractor shall submit an interim schedule followed by a baseline schedule, or only a baseline schedule, depending on when the contractor starts work as described below. All references to "days" within this special note are to be construed as calendar days.

B. INTERIM SCHEDULE. Prior to beginning critical activities, material procurement or site work within the first 28 days after the Start Project Milestone, the Contractor shall submit an interim schedule. The interim schedule must be in CPM schedule format. The interim schedule shall include detailed activities for the work to be accomplished during the first 30 days of the Contract and summary activities for the balance of the work. . No work shall begin without the submission of an interim schedule.

C. BASELINE SCHEDULE. The Contractor shall submit a baseline schedule as outlined in the submission requirements section (C.2) within 28 days after the Start Project Milestone. The baseline schedule is to represent the project as envisioned at the time of bid. No pay estimates will be processed after 28 days without the submission of the baseline schedule. The baseline schedule must be in CPM schedule format and as described below. The Engineer will review the baseline schedule and will indicate the review disposition as "accepted", "accepted as noted" or "rejected" within 14 days of receipt.

For baseline schedules that are "accepted as noted", the Contractor shall make the necessary revisions and resubmit the revised schedule within 14 days. The Engineer will "reject" baseline schedules that are not in compliance with contract requirements. For baseline schedules that are "rejected", the Engineer will indicate in writing portions of the schedule that are not in compliance with the contract requirements. The Project Engineer will conduct a mandatory meeting with the Contractor and the Contractor's Schedule Representative within 7 days of the Engineer's written notice. The purpose of this meeting is to resolve disputes with the baseline schedule so that it may be resubmitted. The Contractor shall submit the revised Baseline Schedule to the Engineer within 14 days of this meeting for review and acceptance.

No pay estimates will be generated until the baseline schedule is "accepted" or "accepted as noted." In the event the baseline schedule is not "accepted" within 90 days of the Start Project Milestone, all work shall cease on the project until the baseline schedule is "accepted." The incurred delays from the "cease work order" will be the Contractor's responsibility and will not be considered for time extension. Any claims associated with time impacts from work performed or due to delay experienced prior to the baseline schedule being "accepted" or "accepted as noted" will be evaluated at the sole discretion of the Engineer. Acceptance by the Engineer will not relieve the Contractor of responsibility for compliance with specifications and contract requirements or for the accuracy or feasibility of

the schedule.

Acceptance of the baseline schedule does not revise the Contract Documents. The baseline schedule must be "accepted" or "accepted as noted" by the Engineer prior to the Engineer evaluating any Contractor claims associated with time impacts.

The Engineer's review of the baseline schedule will be for compliance with the specifications and contract requirements. Acceptance by the Engineer will not relieve the Contractor of responsibility for the accuracy or feasibility of the schedule.

1. Schedule Requirements. Generate and submit an electronic copy of the baseline schedule using Primavera P6 V7.0 by Primavera Systems Inc., Bala Cynwyd, PA, or equivalent electronically transferable software. The Contractor's costs associated with these provisions should be incorporated into the bid item for the progress schedule. Provide and maintain current three licenses of the software for the Engineer's use for the duration of the contract.

Provide a calendar day schedule that shows the various activities of work in sufficient detail to demonstrate a reasonable and workable plan to complete the Project by the Original Contract Completion Date. Include calendar days, not activities, to represent non-work periods due to adverse temperatures or calendar date restrictions. Show the order and interdependence of activities and the sequence for accomplishing the work. Describe all activities in sufficient detail so that the Engineer can readily identify the scope of work and measure the progress of each activity. The baseline schedule must reflect the scope of work, required phasing, maintenance of traffic requirements, interim completion dates, the Original Contract Completion Date, and other project milestones established in the Contract Documents. Only contractually- specified constraints (i.e., milestones) are allowed in the schedule. Include all specified project milestones. Use only project calendars as opposed to global calendars. Do not include commas in activity descriptions because Primavera P6 exports data as comma-separated values. Include activities for submittals, working drawings, shop drawing preparation, submittal review time by the Department for shop drawings, material procurement and fabrication, delivery of materials, plans, and equipment, and other similar activities.

The Contractor shall ensure all work, including that by subcontractors, is included in the schedule. The Contractor shall ensure that all work sequences are logical and that the schedule indicates a coordinated plan.

Failure by the Contractor to include any element of work required for performance of the Contract will not excuse the Contractor from completing all work within the required time. Omissions and errors will be corrected as described in Sections F or H of this note and will not affect contract time.

The Baseline Schedule shall include, as a minimum, the following:

a) Administrative Identifier Information.

- | | |
|-------------------|---------------------------------|
| 1. Project Number | 7. Date of Notice to Begin Work |
| 2. County | 8. Completion Date |

- | | |
|-----------------|-------------------------------------|
| 3. Route Number | 9. Contractor's Name |
| 4. Item Number | 10. Contractor's Dated Signature |
| 5. CID Number | 11. KYTC's Dated Accepted Signature |
| 6. Award Date | |

b) Project Activities.

- i. Activity Identification (ID): Assign each activity a unique identification number. Activity ID length shall not exceed 10 characters. Assign baseline Activity IDs in sequences of 10 (e.g.; A1000, A1010, A1020). This will allow modifications and additional items to be placed into the Identification scheme easily. Once accepted, the Activity ID shall be used for the duration of the project.
- ii. Activity Description: Each activity shall have a narrative description consisting of a verb or work function (e.g.; form, pour, excavate, pier #2) and an object (e.g.; slab, footing, underdrain).
- iii. Activity Original Duration: Assign planned duration in calendar days for each activity. Do not exceed a duration of 20 calendar days for any construction activity unless approved by the Engineer. Do not represent the maintenance of traffic, erosion control, and other similar items as single activities extending to the Completion Date. Break these Contract Items into component activities in order to meet the duration requirements of this paragraph.
- vi. Activity Relationships:
 - All activities, except the first activity, shall have a predecessor(s). All activities, except the final activity, shall have a successor(s).
 - Use finish-to-start relationships with no leads or lags to link activities, or use start-to-start relationships with lags no greater than the predecessor duration to link activities
 - Use of finish-to-finish relationship is permitted when both activities are already linked with a start-to-start relationship. .
 - At least 90% of the relationships must be finish-to-start with no leads or lags.

c) Project Milestones.

- i. Start Project: The Contractor shall include "Start Project" as the first milestone in the schedule. The date used for this milestone is the date the contract is executed and signed by the Department.

- ii. End Project Milestone: The Contractor shall include "End Project" as the last activity in the project schedule. The date used for this milestone is considered the project completion date.
- iii. Start Phase Milestone: The Contractor shall include "Start Phase X" as the first activity for a project phase, where "X" identifies the phase of work.
- iv. End Phase Milestone: The Contractor shall include "End Phase X" as the last activity in a project phase, where "X" identifies the phase of work.

The Contractor may include additional milestones but, at a minimum, must include all contractual milestones.

d) *Schedule Options.* The schedule may only be calculated using retained logic. Show open ends as non-critical. Schedule durations are to be contiguous. The project calendar will be based on the Contractor's plan for completing the project. However, the scheduling increment (hours or days) will be stipulated during the Preconstruction Conference. All days must remain active unless the Contractor is instructed not to work by contract documents. Total float shall be calculated as finish float.

2. Submission Requirements. Submit all schedules within the timeframes specified. Submit the schedule and information in electronic file format via email, and compact disc (CD) compatible with the Engineer's computer. Submit the following information along with the electronic baseline schedule:

- a) A baseline schedule in bar chart format including the Administrative Identifier Information discussed in Section C.I.a on the first page of the schedule. For each activity on the chart, indicate the Activity ID, Activity Description, Original Duration, Remaining Duration, Total Float, Early Start Date, Early Finish Date, and Percent Complete. Use arrows to show the relationships among activities.
- b) A baseline schedule in bar chart format, on paper. Identify the critical path of the project on the bar chart in red. The critical path is defined as the longest path of activities in the project that determines the project completion date. The activities that make-up the critical path are the "Critical Activities."

3. Submittal Cover Memo. All submittals shall be accompanied with a brief cover memo containing:

- Identification of the submission as the Baseline Schedule

- Administrative Identifier Information (see section C.1.a)
- Any critical notes as determined by the Contractor

An example Cover Memo is provided in this note.

D. FLOAT. Use of float suppression techniques, such as preferential sequencing (arranging critical path through activities more susceptible to Department caused delay), lag logic restraints, unrealistic activity durations, zero total or free float constraints, extending activity times, or imposing constraint dates other than as required by the contract, shall be cause for rejection of the project schedule or its updates. Schedules with negative float will also not be accepted.

1. Definitions of Float. Total Float is the length of time along a given network path that the actual start and finish of activity(s) can be delayed without delaying the project completion date. Project Float is the length of time between the End Project Milestone and the Contract Completion Date.

2. Ownership of Float. Float available in the schedule at any time shall not be considered for the exclusive use of either the Department or the Contractor. During the course of contract execution, any float generated due to the efficiencies of either party is not for the sole use of the party generating the float; rather, it is a shared commodity to be reasonably used by either party. Efficiencies gained as a result of favorable weather within a Bi-weekly period, where the number of days of normally anticipated weather is less than expected, will also contribute to the Project Float. A schedule showing work completing in less time than the contract time, and accepted by the Department, will be considered to have Project Float. Project Float will be a resource available to both the Department and the Contractor. No time extensions will be considered or granted nor delay damages paid unless a delay occurs which impacts the project's critical path, consumes all available float and extends the work beyond the Contract Completion Date.

3. Negative Float. Negative float is not allowed. Schedules with negative float will not be accepted. Negative float will not be a basis for requesting time extensions. Any extension of time will be addressed in accordance with the Section F. Scheduled completion date(s) that extend beyond the contract (or phase) completion date(s) may be used in computations for assessment of liquidated damages. The use of this computation is not to be construed as an order by the Department to accelerate the project.

E. BI-WEEKLY UPDATE SCHEDULE. A Bi-weekly update schedule is a schedule in which only progress is updated from the prior data date to the current data date. Work added and/or excusable delays encountered since the prior data date must be represented as a schedule revision as described in Section E.

1. Update Requirements. Bi-weekly on a date set at the Preconstruction Conference and until Formal Acceptance, submit an updated schedule and all required

information with a data date of the last day of the preceding bi-weekly submittal. The date for submission and data date may be adjusted to accommodate regularly scheduled progress meetings. Submit the Bi-weekly updated bar chart on paper and a copy of the updated schedule in electronic format in Section C.2. The Engineer shall "accept" or "reject" the schedule update within 14 days of receipt of the updated CPM schedule. The Engineer may withhold estimates if the updated schedule is not submitted as required by this section. For each updated schedule, identify the actual start and finish dates for all completed activities and the actual start date and remaining duration for all activities in progress. Provide a written narrative that identifies any changes or shifts in the critical path and submit reasons for the changes or shifts in the critical path.

Submit the following with each updated schedule:

- a) CPM Schedule in Bar Chart Format
- b) Electronic files (formatted as described above)

2. Submittal Cover Memo. All update submittals shall be accompanied with a brief cover memo containing all the information require in the Baseline Submittal Cover Memo per section C.3 with the addition of:

- Baseline Report
 - Narrative of baseline expectations
 - Project completion status per baseline expectations of Logic Report
 - Logic Modification Report per section F
 - Narrative of all logic changes and reasoning
 - Two separate CPM submissions; one reflecting the schedule without changes in logic, the other reflecting the proposed logic and the effects.
 - Description of fragnet required per section F
- Progress Report
 - Narrative of all schedule changes since last update
 - Details of each change including impact of change on the schedule, float consumption or addition, and reason causing change when float is consumed

F. REVISIONS. The Work may require and/or the Contractor may make revisions to the CPM schedule. Addition of new activities (fragnets required) or new calendars or changes to existing activities, calendars, original durations or logic constitute a revision. All revisions must be reported in a Logic Modification Report. The Logic Modification Report is a separate CPM update which includes all the changes recommended by the Contractor within the current Bi-weekly update schedule. It shall include a Narrative explanation of the necessary changes accompanying the Bi-weekly update schedule. Any revision which modifies the critical path or impacts an interim date or project completion date is considered a Logic Modification. A fragnet is defined as the sequence of new activities that are proposed

to be added to the existing schedule. The fragnet shall identify the predecessors to the new activities and demonstrate the impacts to successor activities. If submitted as a fragnet, the Contractor shall compute two Finish Dates. The first Finish Date shall be computed without consideration of any impact by the fragnet. The second Finish Date shall be computed with consideration of any impact by the fragnet. The Contractor shall also submit a written narrative stating the reason for the proposed revisions. The Engineer shall "accept" or "reject" proposed revisions within 14 days of receipt of appropriate schedules and narrative. All approved revisions will be incorporated into the Bi-weekly Update Schedule which will become the Revised Bi-weekly Update Schedule.

G. TIME EXTENSIONS. The Work may require and/or the Contractor may request an extension of the Completion Date. Perform the following analysis to compute the duration of the time extension. Submit two paper copies and two electronic copies of each analysis performed.

1. Determine project progress prior to circumstance(s) necessitating the time extension. Unless the Engineer requests an interim schedule updated to the date of the circumstance alleging to have caused delay, the previous accepted Bi-weekly update shall be used to display the prior progress of the project. This schedule is referred to as the Un-impacted Schedule. Unless otherwise agreed in advance by the Department and the Contractor, the impact will be based upon when the work is to be performed as opposed to authorized. Time extensions based on estimated impacts will be the Contractor's risk.
2. Prepare a fragmentary network (fragnet) depicting the circumstance that is believed to have delayed the project. Estimate duration of impact as accurately as possible. The time extension will be based upon actual durations as described below.
3. Insert the fragnet into the Un-impacted Schedule, run the schedule calculations and determine the finish date. This schedule is referred to as the Impacted Schedule.
4. Compare the Impacted Schedule finish date with the Un-impacted Schedule finish date in order to determine the estimated duration of any warranted time extension.
5. Within 14 days of the termination of the impact, submit a schedule update which includes the actual dates of the impact, and the resulting impact to the project milestones.

Submit the impacted schedule with the request for time extension. Include a narrative report describing the effects of new activities and relationships to interim and contract completion dates. All time extensions approved by the Engineer will be incorporated into the Bi-weekly update with the fragnet used to determine impacts incorporated into the schedule.

H. RECOVERY SCHEDULE. If the Bi-weekly Update Schedule or Revised Bi-weekly Update Schedule projects a finish date for the Project more than 14 calendar days later than the Contract Completion Date, submit a recovery schedule showing a plan to finish by the current Completion Date. The acceptance of any schedule projecting a completion date for the Project beyond the Current Contract Completion Date does not constitute approval of a time extension or an order to accelerate. All changes to completion dates and orders to

accelerate must be made via Change Order. The Department will withhold Estimates until the Engineer "accepts" the recovery schedule. The Engineer will use the schedule to evaluate time extensions and associated costs requested by the Contractor. In the event the current Completion Date is in dispute, the recovery schedule will need to be submitted once the dispute has been resolved.

I. BASIS OF PAYMENT. The Department will make partial payments according to Section 109.05 of the standard specifications and as modified by the following schedule:

- 1. The Department will release 50 percent of the lump sum amount bid for Project CPM Schedule to the Contractor with the first regular payable after the Engineer has accepted" the CPM Baseline schedule submission and the Department has received the scheduling software.
- 2. The Department will release an additional 25 percent of the lump sum amount bid for Project CPM Schedule to the Contractor with the first regular estimate payable after 50 percent of the original contract amount is complete.
- 3. The Department will release the remaining 25 percent of the lump sum amount bid for Project CPM Schedule to the Contractor with the first regular estimate payable after project completion.

The Department will pay for the accepted quantities at the contract price as follows:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02570	Project CPM Schedule	Lump Sum

The Department will consider payment as full compensation for all work required in this provision.

SPECIAL NOTE FOR PROJECT INSPECTION BOAT

DESCRIPTION. Project Inspection Boat shall consist of providing a boat and safety equipment at the site, along with adequate training and docking facilities as specified below. The boat shall be for the exclusive use of, and operated by, the Engineer or his personnel.

PROJECT INSPECTION BOAT. The boat shall not be less than 18 ft (5.5 m) in length with at least a 72-inch (1.8 m) beam, equipped with an outboard motor of at least 70 horsepower (52 kw), and shall be capable of accommodating at least 6 adult passengers, including the operator. In addition, the Engineer shall at all times retain the right to travel on, or be present on, any of the Contractor's floating plants or equipment. The boat shall remain on site at all times.

The boat shall be in good condition and meet the approval of the Engineer. The boat and safety equipment shall at all times meet all applicable boating regulations of the United States Coast Guard.

The boat shall be equipped with 2 fuel tanks, complete remote control, a spotlight and an adequate whistle or horn. The motor shall be equipped with electric and hand starters, an alternator or generator, and slip clutch propeller protection. These requirements are in addition to all Coast Guard or State requirements.

The boat shall be equipped with a depth finder and trolling motor.

The Contractor shall service, gas, oil and maintain the boat during the life of the contract unless otherwise directed by the Engineer.

TRAINING FOR DEPARTMENT PERSONNEL. The Contractor shall provide field training by someone proficient in the operation of the boat to ensure that approximately 3 to 5 employees of the Department, or their representative, are competent in the proper operation, safety features and handling on open water and while docking. The required training time is anticipated to be no more than one-half day.

INSURANCE FOR PROJECT INSPECTION BOAT. The Contractor shall furnish the Engineer with evidence that liability insurance has been obtained, with a minimum coverage of \$500,000, and shall hold the Department and its representatives harmless from any and all damage to, or caused by, the boat while being operated by the Engineer.

The insurance shall be kept in effect until the project is completed, and the evidence of renewal of the policy as necessary shall be forwarded to the Engineer.

MEASUREMENT. The Department will measure all work performed as part Project Inspection Boat as a lump sum.

PAYMENT. The Department will consider payment as full compensation for all work required under this section.

Payment will be made under:

<u>BID ITEM CODE</u>		
24626EC	PROJECT INSPECTION BOAT	LS

SPECIAL NOTE FOR PROJECT INSPECTION BOAT

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MEASUREMENT. The Department will measure all work performed as part Project Inspection Boat as a lump sum.

PAYMENT. The Department will consider payment as full compensation for all work required under this section.

Payment will be made under:

<u>BID ITEM CODE</u>		
24626EC	PROJECT INSPECTION BOAT	LS

SPECIAL NOTE FOR CONSTRUCTION ACCESS

1.0 DESCRIPTION. This item shall consist of temporary works that the Contractor elects to use in Lake Barkley and along its shoreline in order to access the proposed bridge structure. Such works shall be in accordance with any limits or restrictions specified by the Contract Documents and Permits, and may potentially include:

- design and construction of trestles, trestle fingers, temporary fender system, moorings, anchorages, bulkheads, and/or barges
- dredging of shallow areas and disposal of spoils

This item includes: use of and removal of barges and associated spud piles, moorings and/or anchorages which the Contractor may elect to use; maintenance of temporary trestles and other temporary works in safe and serviceable condition at all times; and removal of temporary trestles, temporary fill, piles and fenders. This item also includes any test pits to locate utilities within the footprint of the trestle or dredging areas and the protection of such utilities required for installation of the construction access.

Trestles, bulkheads, and any other temporary works the Contractor elects to use shall be designed and constructed in accordance with: the project permits; the design loadings specified on the plans (where applicable); KYTC Standard Specifications; the AASHTO *Guide Design Specifications for Temporary Works*, 1st Ed., 2008 Interims; AASHTO *Construction Handbook for Bridge Temporary Works*, 1st Ed., 2008 Interims; and the AAHSTO LRFD *Bridge Construction Specifications*, 3rd Ed. Temporary works shall not impede waterway navigation except as allowed by the project specifications and permits and “Special Note for Helper Boat.”

Any information shown on the Contract Plans pertaining to construction access or methods conveys the assumptions made by the Designer in designing the overall structure and is for information only. The Contractor shall be responsible for selecting the means and methods for construction of this contract, subject to the design and environmental permit restrictions. The Contractor shall submit information in accordance with this special note and the standard specifications, and shall include design calculations, construction schematics, construction sequences and procedures to the Engineer for review and acceptance.

The information shown on the plans has been permitted by the governing local, state and federal agencies. The Contractor shall be responsible for obtaining any revised permits due to changes in construction methodology which affect environmental or navigational impacts identified in any governing local, state or federal agency permit.

The Contractor is advised that obtaining approval from governing and permitting agencies may not be an expedient process and should be taken into consideration when selecting the means and methods for construction.

2.0 MATERIALS. Materials shall be selected by the Contractor to meet the specification requirements of this note and shall be suitable and fit for the intended purpose of supporting the required loads.

3.0 CONSTRUCTION METHODS. The Contractor shall submit a signed statement to the effect that his means and methods for construction meet all requirements of the regulatory permits for the project. Contractor shall submit to the Engineer detailed final construction access and methodology working drawings and computations of his proposal for review and approval at least 45 calendar days prior to undertaking any work in the lake. No work shall begin in the lake until the working drawings have been approved by the Engineer. These plans shall include, as a minimum, the limits of fill, limits and elevations of dredging, limits and details for bulkheads and trestles, locations of barges, and methods of mooring barges and a barge mooring analysis. Also, the drawings shall include the sequence and method of erection of the new structure, barge movements, barge locations, and all limitations of operations outlined in this special note and the project specifications. Design calculations supporting the proposed construction access plans stamped by a Professional Engineer licensed in Kentucky shall be submitted with the plans.

Driving criteria for steel piles required for trestles, moorings or bulkheads shall be specified in writing by a geotechnical engineer licensed in Kentucky and submitted with the plans.

The design of all trestle components including, but not limited to, decking, floor beams, stringers, piles and sheeting shall be done in accordance with the specifications identified within this special note.

Maintenance: The Contractor shall be responsible for maintaining and repairing any damage to the temporary trestle caused by natural events or incurred from private or commercial vessels at no cost to the Department. Maintenance and repair is necessary only to the level required to ensure safety to workers and the vehicular and marine traveling public and to enable the trestle to perform its intended function. The maintenance period shall be the duration the trestle is in place.

4.0 DEMOLITION AND DISPOSAL. All temporary works shall be removed upon completion of construction. The removal of any and all temporary works structures is essential to the final completion of the project and shall be performed in accordance with the standard specifications and permits.

5.0 MEASUREMENT. Construction access will be paid for on a lump sum basis and will not be measured for payment.

6.0 PAYMENT. Construction access will be paid for at the contract lump sum price for "Construction Access", which price shall include the design, construction, maintenance and removal of any piles and fenders, fill, abutments, bulkheads to contain fill, test pits, utility protection, trestles, barges, moorings, anchors, materials, tools, equipment, labor and work incidental thereto. This lump sum price will also include all dredging construction and disposal of spoils in accordance with the project specifications and permits.

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
24740EC	CONSTRUCTION ACCESS	LS

SPECIAL NOTE FOR ENGINEERING-RELATED CONSULTING SERVICES

Trigg County; Item No. 1-180.60 Lake Barkley Bridge

Because of their ongoing involvement with this project as consultants to the Department, Michael Baker International, Palmer Engineering, Terracon, and ICA Engineering will not be permitted to perform any services as consultants to the Prime Contractor or Subcontractors on this project due to the potential for a conflict of interest. Other firms who have previously performed consulting services for the Department on this project may perform such services, subject to meeting applicable pre-qualification, experience, and/or other requirements.

SPECIAL NOTE FOR INTERMEDIATE MILESTONES

INTERMEDIATE MILESTONES - The following intermediate milestone is specified for this contract with the following date:

- **Bridge Open to Traffic: October 31, 2017**

The **Bridge Open to Traffic** milestone is defined as the condition that exists when bridge and roadway work is sufficiently complete to provide a minimum of two lanes open to traffic on the new bridge, with both directions open to traffic at all times, including the following:

1. Each direction shall have a minimum of one 11 ft. lanes, a 2 ft. outside shoulder and, if divided from opposing traffic shall also have a 2 ft. inside shoulder,
2. The full width of bridge deck shall be cast and completed including overlays where applicable,
3. Painting of all Arch Span structural steel,
4. All safety features shall be in place including but not limited to guardrail, all traffic barriers except portions noted below, signs, and pavement markings.
5. After the new bridge is open to traffic, the existing bridge shall be permanently closed to the public.

Work not required to be completed by the Bridge Open to Traffic date includes:

1. Items related to the multi-use path not on bridge,
2. Painting of Approach Spans structural steel,
3. pedestrian railings,
4. metal rails and posts of traffic barrier if traffic is protected from by temporary barrier,
5. path delineation lighting,
6. arch aesthetic lighting,
7. parking areas, and
8. seeding.

As approved by the Engineer, short-term temporary lane shifts to complete minor punch list items after the Bridge Open to Traffic date may be allowed.

An incentive of \$20,000 per calendar day will be paid for each day, or portion thereof, that the work associated with this milestone is completed earlier than the Bridge Open to Traffic date. The maximum incentive payment for this milestone will be \$1,500,000.

If the work associated with this milestone is not complete on or before the Bridge Open to Traffic date, no incentive will be paid and only disincentive fees will apply.

If the work associated with this milestone is not complete on or before the Bridge Open to Traffic date, a disincentive fee of \$20,000 per calendar day, or portion thereof, will be assessed. There will be no maximum disincentive fee.

Disincentive fees and liquidated damages will be cumulative.

The Project Completion date is September 30, 2018.

SPECIAL NOTE FOR AVIATION CONSTRUCTION PERMITS

The Contractor is hereby notified that any permanent structure, bridge, or temporary structure, cranes, that will exceed 200 feet above normal pool elevation 358.8 (NAVD88) is required to be permitted through the Kentucky Airport Zoning Commission (KAZC) through their form TC-56-50. The Federal Aviation Administration (FAA) must also be notified of the construction utilizing FAA Form 7460.

The permanent bridge structure has previously been found to not require a permit because of its height. It is expected that cranes utilized for the project will exceed 200 feet and will have to have permits maintained during their use on the project.

The Contractor shall be responsible for submitting the appropriate forms to KAZC and the FAA and obtaining the necessary construction permits. The Contractor shall comply with all conditions including obstruction lighting if required. The temporary permits required have a limited duration and must be updated periodically. The KAZC permit's duration is 4 months and the FAA notice of construction duration is 18 months. It shall be the Contractor's responsibility for maintaining these permits during construction.

SPECIAL NOTE FOR MAINTAINING EXISTING BRIDGE

1.0 SCOPE OF WORK.

In addition to the Contractor’s responsibility described in specification 105.11, the Contractor shall be responsible for the maintenance of the existing Henry Lawrence Bridge deck, curb, railing, joints, and any other component item on the structure that is identified by the Engineer for maintenance. The period of responsibility for maintenance will start when the Contractor begins mobilization to the site, continues throughout construction and until public traffic has been shifted onto the new bridge and is no longer required on the existing bridge. No extension of time will be granted for maintaining the existing Henry Lawrence Bridge.

3.0 PAYMENT.

The Department has established an allowance within the project budget to perform anticipated bridge maintenance activities as directed by the Engineer. The maintenance performed will be paid as Force Account Work in accordance with specification 109.04.02. Provide justification and documentation to support payment for all work performed. Maintain cost records reconciled daily conforming to specification 109.04.02.E. The Department will make payment for authorized work to maintain the existing bridge per the following:

<u>BID ITEM CODE</u>	<u>PAY ITEM</u>	<u>PAY UNIT</u>
24755EC	Maintain Existing Bridge	DOLL

**SPECIAL NOTE FOR
GUARDRAIL END TREATMENT TYPE 1**

Contrary to KYTC Standard Drawing RBR-020-05 the guardrail end treatment ET-Plus manufactured by Trinity Industries will not be permitted as an option for bid item “Guardrail End Treatment Type 1”.

Special Note on Tree Cutting Restrictions

TO THE EXTENT PRACTICABLE, ALL TREES TO BE REMOVED DURING CONSTRUCTION SHALL BE FALLEN BETWEEN OCTOBER 15, 2014 AND MARCH 31, 2015, INCLUSIVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING KYTC DIVISION OF ENVIRONMENTAL ANALYSIS (200 MERO STREET, FRANKFORT, KY 40622), AN ACCOUNTING FOR ANY TREES THAT WILL BE AFFECTED BY THE PROJECT AFTER MARCH 31, 2015. THIS RECORD SHALL BE PROVIDED BY NO LATER THAN APRIL 15, 2015. THROUGHOUT THE REMAINDER OF THE CONTRACT, THE CONTRACTOR SHOULD ASSUME THAT TREE REMOVAL SHALL BE RESTRICTED TO THE WINTER MONTHS BEGINNING OCTOBER 15 AND ENDING MARCH 31, INCLUSIVE. ALTERNATIVELY, THE CONTRACTOR MAY AVOID THE RESTRICTIONS BY MAKING PAYMENT FOR THE ADDITIONAL TREE LOSS AT A COST OF UP TO \$6,300.00 PER ACRE TO BE REMOVED.



BRIDGE PERMIT

7 NOV 2014

(9-14-8)

WHEREAS by Title V of an act of Congress approved August 2, 1946, entitled "General Bridge Act of 1946," as amended (33 U.S.C. 525-533), the consent of Congress was granted for the construction, maintenance and operation of bridges and approaches thereto over the navigable waters of the United States;

AND WHEREAS the Secretary of Homeland Security has delegated the authority of Section 502(b) of that act to the Commandant, U.S. Coast Guard by Department of Homeland Security Delegation Number: 0170.1;

AND WHEREAS before construction is commenced, the Commandant must approve the location and plans of any such bridge and may impose any specific conditions relating to the construction, maintenance and operation of the structure deemed necessary in the interest of public navigation, such conditions to have the force of law;

AND WHEREAS the - COMMONWEALTH OF KENTUCKY - has submitted for approval the location and plans of a bridge to be constructed across the Cumberland River (Lake Barkley) between The Land Between the Lakes and Canton, Kentucky;

NOW THEREFORE, This is to certify that the location and plans dated 18 February 2014 are hereby approved by the Commandant, subject to the following conditions:

1. No deviation from the approved plans may be made either before or after completion of the structure unless the modification of said plans has previously been submitted to and received the approval of the Commandant.

2. The construction of falsework, pilings, cofferdams or other obstructions, if required, and the scheme for constructing the bridge shall be in accordance with plans submitted to and approved by the Commander, Eighth Coast Guard District, prior to construction of the bridge. All work shall be so conducted that the free navigation of the waterway is not unreasonably interfered with and the present navigable depths are not impaired. Timely notice of any and all events that may affect navigation shall be given to the District Commander during construction of the bridge. The channel or channels through the structure shall be promptly cleared of all obstructions placed therein or caused by the construction of the bridge to the satisfaction of the District Commander, when in the judgment of the District Commander the construction work has reached a point where such action should be taken, but in no case later than 90 days after the bridge has been opened to traffic.

Continuation Sheet

**Bridge across the Cumberland River (Lake Barkley) between
The Land Between the Lakes and Canton, Kentucky**

7 NOV 2014
BRIDGE PERMIT
(9-14-8)

3. Issuance of this permit does not relieve the permittee of the obligation or responsibility for compliance with the provisions of any other law or regulation as may be under the jurisdiction of any federal, state or local authority having cognizance of any aspect of the location, construction or maintenance of said bridge.

4. A bridge fendering system shall be installed and maintained in good condition by and at the expense of the owner of the bridge when so required by the District Commander. Said installation and maintenance shall be for the safety of navigation and be in accordance with plans submitted to and approved by the District Commander prior to its construction.

5. Clearance gauges shall be installed and maintained in a good and legible condition by and at the expense of the owner of the bridge when so required by the District Commander. The type of gauges and the locations in which they are to be installed will be submitted to the District Commander for approval.

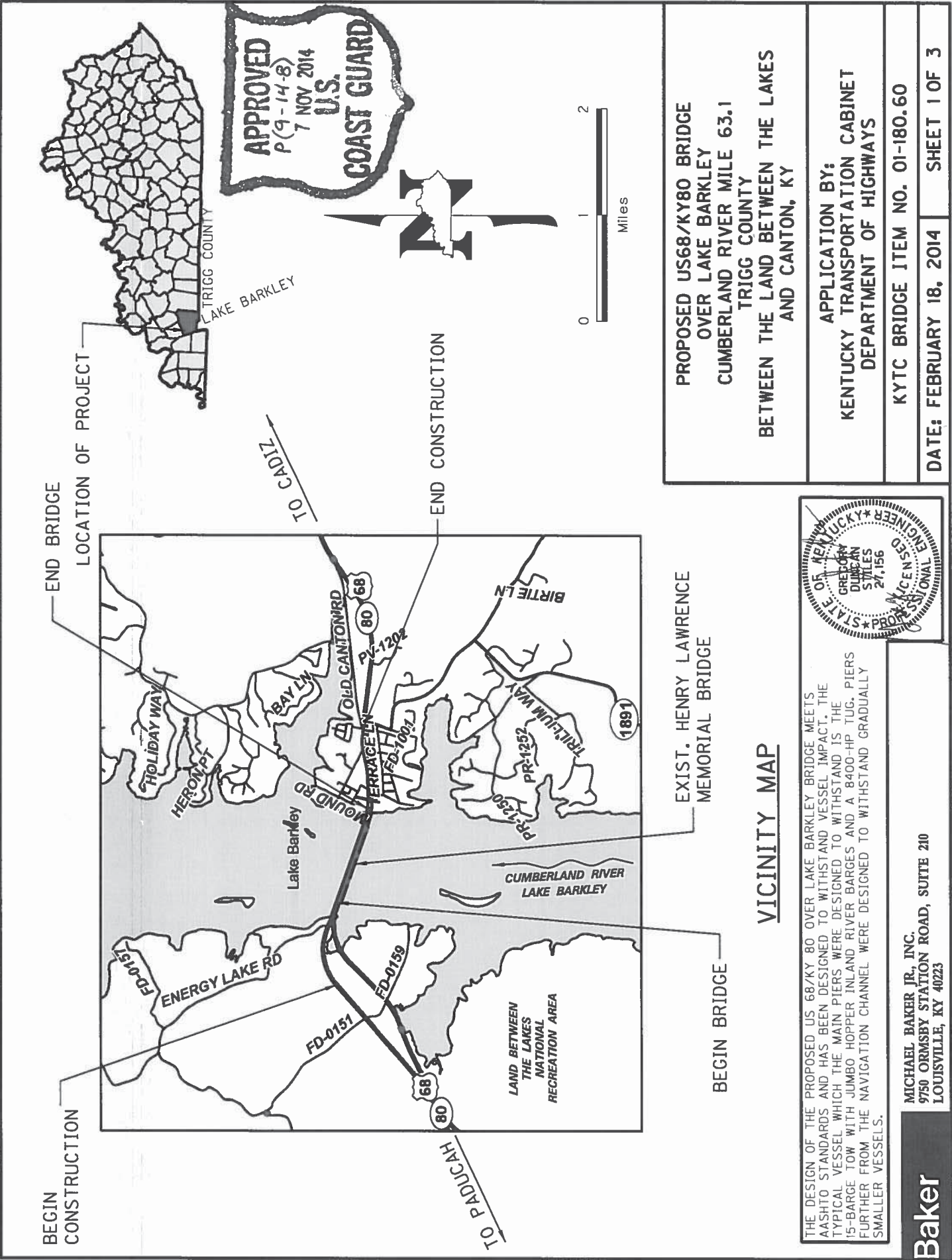
6. All parts of the existing to-be-replaced Henry R. Lawrence Memorial Bridge across the Cumberland River (Lake Barkley), mile 63.1, not utilized in the new bridge except piers 2, 3 and 4 shall be removed down to or below two feet below the natural ground line or mudline. Piers 2, 3 and 4 shall be removed down to or below elevation 330.0 feet, Mean Sea Level. The waterway shall be cleared to the satisfaction of the District Commander when in the judgment of the District Commander the construction work has reached a point where such action should be taken, but in no case later than 90 days after the bridge has been opened to traffic.

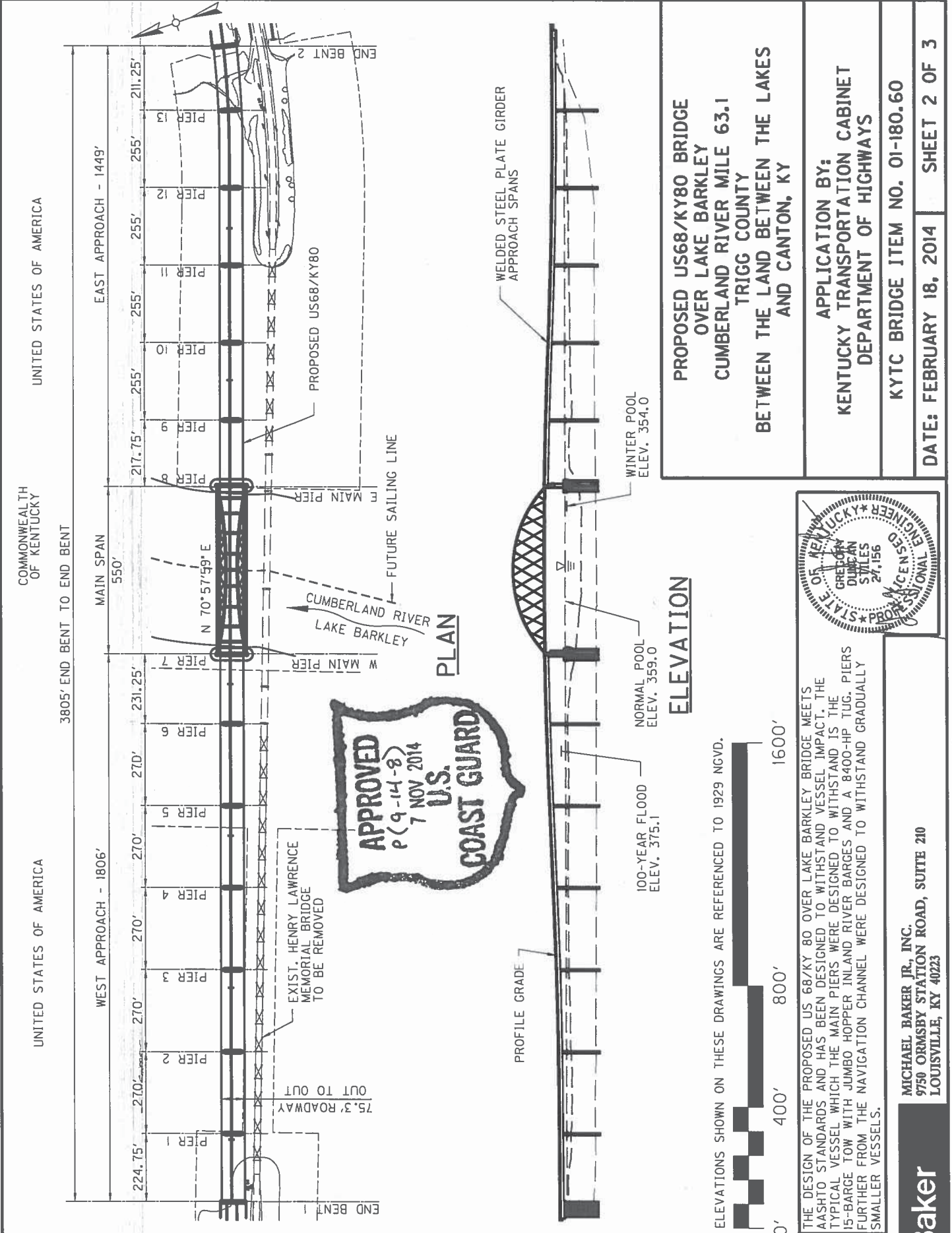
7. When the proposed bridge is no longer used for transportation purposes, it shall be removed in its entirety or to an elevation deemed appropriate by the District Commander and the waterway cleared to the satisfaction of the District Commander. Such removal and clearance shall be completed by and at the expense of the owner of the bridge upon due notice from the District Commander.

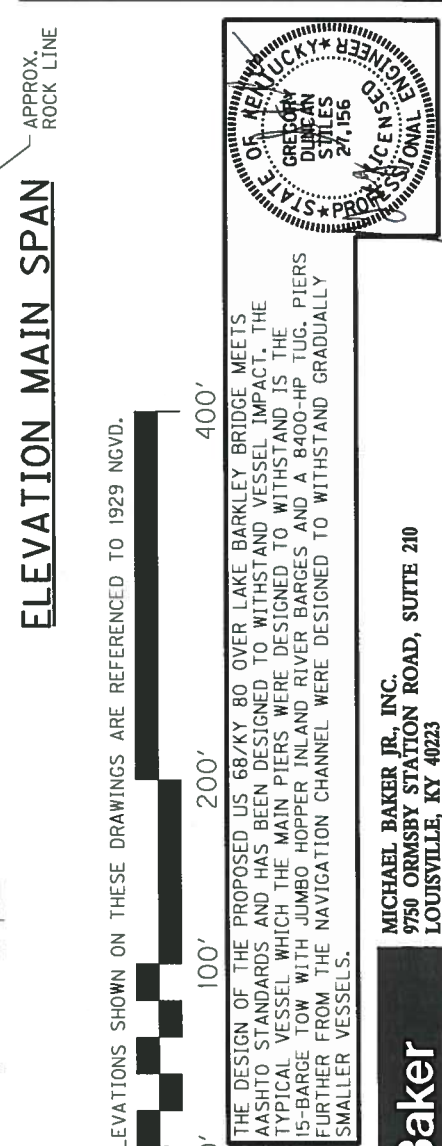
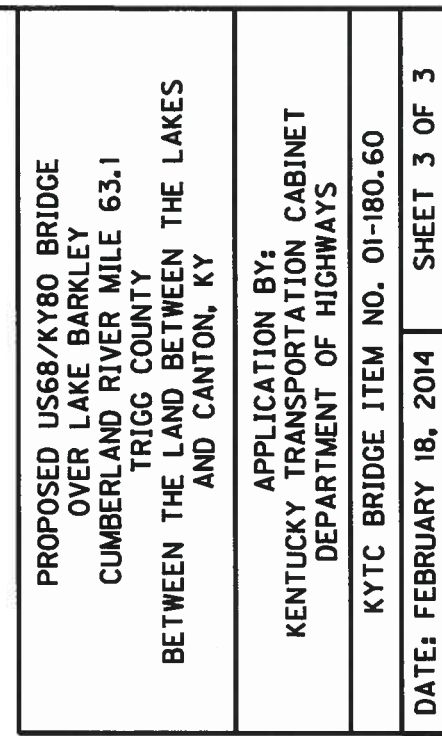
8. The approval hereby granted shall cease and be null and void unless construction of the bridge is commenced within five years and completed within eight years after the date of this permit.



Brian L. Dunn
Chief, Office of Bridge Programs
U.S. Coast Guard
By direction of the Commandant







Special Note for Bridge Demolition, Renovation and Asbestos Abatement

If the project includes any bridge demolition or renovation, the successful bidder is required to notify Kentucky Division for Air Quality (KDAQ) via filing of form (DEP 7036) a minimum of 10 days prior to commencement of any bridge demolition or renovation work.

Any available information regarding possible asbestos containing materials (ACM) on or within bridges to be affected by the project has been included in the bid documents. These are to be included with the Contractor's notification filed with the KDAQ. If not included in the bid documents, the Department will provide that information to the successful bidder for inclusion in the KDAQ notice as soon as possible. If there are no documents stating otherwise, the bidders should assume there are no asbestos containing materials that will in any way affect the work.



TRANSPORTATION CABINET

Frankfort, Kentucky 40622
www.transportation.ky.gov

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

Memorandum

To: Blake Beyer
CC: Tim Foreman
From: O'Dail Lawson
Environmental Scientist II
Division of Environmental Analysis
Date: 10/13/2014
Re: Asbestos Inspection Report for Trigg 1-180.60

This report is prepared to accompany the 10-Day NOI for Demolition to the Division of Air Quality. Please include all pages with submittal.

Project and Structure Information

Project # 1-180.60

Bridge # 111B00020N

Description: All samples collected were negative for asbestos. No abatement necessary.

Inspection Date: September 26th, 2014

Results

The results revealed that there is no ACM abatement required at this time.



An Equal Opportunity Employer M/F/D

MRS, Inc. Analytical Laboratory Division

Fax: (502) 491-7111

BULK SAMPLE ASBESTOS ANALYSIS

Analysis N#	2410026	Address:	Trigg County - 1 180.60
Client Name:	KYTC		111B00020N
Sampled By:	O'Dail Lawson		

[illegible]

Methodology : EPA Method 600/R-93-116

Date Analyzed : 2-Oct-14
Analyst : Winterford Mensah

Reviewed By: Winston M. Mera
Signature

The test relates only to the items tested. This report does not represent endorsement by NVLAP or any agency of the U.S. Government. Partial reproduction of any part of this report is strictly prohibited. Samples shall be retained for (30) days.

AIHA # 102459

AJHA #1 02459



Kentucky Transportation Cabinet

200 Mero Street, 5th Floor West
Frankfort, Kentucky 40622
(502) 564-7250 fax (502) 564-5655

KENTUCKY
TRANSPORTATION
CABINET

KYTC
O'Dail Lawson o'dail.lawson@ky.gov

Address: 200 Micro Street

Frankfort KY

Phone: 502-782-5020

Fax: 502-564-5655

PO#:

Client Information **KY TRANSPORTATION CABINET**

Results Code:

ND = None Detected

FTD = Filter Tampering or Damaged

N/A = Not Applicable

1115000204
Samplers (signature)

Samplers (signature)

Project or Subject Reference

Tring / 180.60

[illegible]

Relinquished By:

Date/Time:

Received By:

Date/Time:

Relinquished By:

Date/Time:

Received at Lab By:

Date/Time:

KYTC COC.xlsx

The EI Group, Inc.

This certifies that

Tilmon O'Dail Lawson

Student Address: 132 Old Fort Drive, Georgetown, Kentucky 40324

Has attended and satisfactorily passed an examination covering the contents of an EPA/AHERA approved course entitled

Asbestos Inspector Refresher (4-Hour) Training Course

7214080013

Certificate Number

7910

Social Security Number

August 15, 2014

Course Dates

August 15, 2014

Exam Date

August 15, 2015

Expiration Date

Louisville, KY

Course Location

Barry A. Maxwell

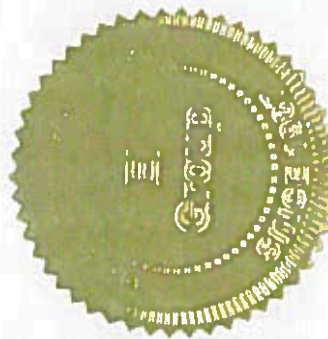
Barry Maxwell, Training Manager

Kerri Boddy

Kerri Boddy, Principal Instructor

Kerri Boddy

Kerri Boddy, Exam Administrator



3240 Office Pointe Place, Suite 102
Louisville, KY 40220
888-372-5859

Right-of-Way Certification Form

Revised 2/22/11

☒ Federal Funded

☒ Original

☐ State Funded

☐ Re-Certification

This form must be completed and submitted to FHWA with the PS&E package for federal-aid funded Interstate, Appalachia, and Major projects. This form shall also be submitted to FHWA for all federal-aid projects that fall under Conditions No. 2 or 3 outlined elsewhere in this form. When Condition No. 2 or 3 apply, KYTC shall resubmit this ROW Certification prior to construction contract Award. For all other federal-aid projects, this form shall be completed and retained in the KYTC project file.

Date: October 27, 2014

Project Name: Bridge Over Lake Barkley

Letting Date: December 19, 2014

Project #: EMARS# 5138216D

County: Trigg

Item #: 01-180.60

Federal #: BRO

Description of Project: CADIZ-AURORA; BRIDGE OVER LAKE BARKLEY.

Projects that require NO new or additional right-of-way acquisitions and/or relocations

- ☒ The proposed transportation improvement will be built within the existing rights-of-way and there are no properties to be acquired, individuals, families, and businesses ("relocatees") to be relocated, or improvements to be removed as a part of this project.

Projects that require new or additional right-of-way acquisitions and/or relocations

- ☐ Per 23 CFR 635.309, the KYTC hereby certify that all relocatees have been relocated to decent, safe, and sanitary housing or that KYTC has made available to relocatees adequate replacement housing in accordance with the provisions of the current FHWA directive(s) covering the administration of the Highway Relocation Assistance Program and that at least one of the following three conditions has been met. (Check those that apply.)

- ☐ Condition 1. All necessary rights-of-way, including control of access rights when applicable, have been acquired including legal and physical possession. Trial or appeal of cases may be pending in court but legal possession has been obtained. There may be some improvements remaining on the right-of-way, but all occupants have vacated the lands and improvements, and KYTC has physical possession and the rights to remove, salvage, or demolish all improvements and enter on all land. Fair market value has been paid or deposited with the court.

- ☐ Condition 2. Although all necessary rights-of-way have not been fully acquired, the right to occupy and to use all rights-of-way required for the proper execution of the project has been acquired. Trial or appeal of some parcels may be pending in court and on other parcels full legal possession has not been obtained, but right of entry has been obtained, the occupants of all lands and improvements have vacated, and KYTC has physical possession and right to remove, salvage, or demolish all improvements. Fair market value has been paid or deposited with the court for most parcels. Fair market value for all pending parcels will be paid or deposited with the court prior to AWARD of construction contract. (See note 1 below.)

Note 1: The KYTC shall re-submit a right-of-way certification form for this project prior to AWARD of all Federal-Aid construction contracts. Award must not be made until after KYTC has obtained full legal possession and fair market value for all parcels has been paid or deposited with the court and FHWA has concurred in the re-submitted right-of-way certification.

Right-of-Way Certification Form

Revised 2/22/11

- ☐ Condition 3. The acquisition or right of occupancy and use of a few remaining parcels are not complete and/or some parcels still have occupants. However, all remaining occupants have had replacement housing made available to them in accordance with 49 CFR 24.204. The KYTC is hereby requesting authorization to advertise this project for bids and to proceed with bid letting even though the necessary rights-of-way will not be fully acquired, and/or some occupants will not be relocated, and/or the fair market value will not be paid or deposited with the court for some parcels until after bid letting. KYTC will fully meet all the requirements outlined in 23 CFR 635.309(c)(3) and 49 CFR 24.102(j) and will expedite completion of all acquisitions, relocations, and full payments after bid letting and prior to AWARD of the construction contract or force account construction. A full explanation and reason for this request, including identification of each such parcel and dates on which acquisitions, payments, and relocations will be completed, is attached to this certification form for FHWA concurrence. (See note 2.)

Note 2: The KYTC may request authorization on this basis only in unique and unusual circumstances. Proceeding to bid letting shall be the exception and never become the rule. In all cases, the KYTC shall make extraordinary efforts to expedite completion of the acquisition, payment for all affected parcels, and the relocation of all relocatees prior to AWARD of all Federal-Aid construction contracts or force account construction.

Approved:

Greg L. Morgan
Printed Name

[Signature]
Signature

10/27/14
Right-of-Way Supervisor

Approved:

DM Lu
Printed Name

[Signature]
Signature

07 Nov 2014
KYTC, Director of ROW & Utilities

Approved:

Printed Name

No Signature Required
as per FHWA - KYTC
2013 Stewardship Agreement

Signature

FHWA, ROW Officer (when applicable)

Right-of-Way Certification Form

Revised 2/22/11

Date: October 27, 2014

Project Name: Bridge Over Lake Barkley
Project #: EMARS# 5138216D County: Trigg
Item #: 01-180.60 Federal #: BRO
Letting Date: December 19, 2014

This project has 0 total number of parcels to be acquired, and 0 total number of individuals or families to be relocated, as well as 0 total number of businesses to be relocated.

- 0 Parcels where acquired by a signed fee simple deed and fair market value has been paid
- 0 Parcels have been acquired by IOJ through condemnation and fair market value has been deposited with the court
- 0 Parcels have not been acquired at this time (*explain below for each parcel*)
- 0 Parcels have been acquired or have a "right of entry" but fair market value has not been paid or has not been deposited with the court (*explain below for each parcel*)
- 0 Relocatees have not been relocated from parcels , , , , , , and (*explain below for each parcel*)

Parcel #	Name/Station	Explanation for delayed acquisition, delayed relocation, or delayed payment of fair market value	Proposed date of payment or of relocation

There are 0 billboards and/or 0 cemeteries involved on this project.

There are 0 water or monitoring wells on parcels , , , , and . All have been acquired and are the responsibility of the project contractor to close/cap.

Form Effective Date: April 1, 2006
Last Revised: February 22, 2011

SPECIAL NOTES FOR UTILITY CLEARANCE
IMPACT ON CONSTRUCTION

TRIGG COUNTY NHPP BRO 0801 (101)
FD52 111 51382
CADIZ-AURORA BRIDGE OVER LAKE BARKLEY
SIX YEAR PLAN ITEM NUMBER 01-180.60

GENERAL PROJECT NOTE ON UTILITY PROTECTION

This project has Utility Relocations that will require coordination with the Utility owner in order to be integrated into the construction phasing of this project. The AT&T Fiber and Pennyrile Electric services that are currently on the old bridge will have to be rerouted temporarily at the east bridge approach while the new structure is being built.

NOTE: DO NOT DISTURB THE FOLLOWING UTILITIES LOCATED WITHIN THE PROJECT DISTURB LIMITS

AT&T has an existing buried FIBER OPTIC CABLE located at approximately STA 23140+00 to STA 3149+00 at the west approach to the existing bridge structure. This utility is not to be disturbed until such time that the relocation to the new structure can be coordinated with AT&T.

AT&T has an existing aerial FIBER OPTIC CABLE located at approximately STA 3179+50 to STA 3202+00 at the east approach to the existing bridge structure. This utility is not to be disturbed until such time that the relocation can be coordinated with AT&T.

The Contractor is fully responsible for protection of all utilities listed above

THE FOLLOWING COMPANIES ARE RELOCATING/ADJUSTING THEIR UTILITIES WITHIN THE PROJECT LIMITS AND WILL BE COMPLETE PRIOR TO CONSTRUCTION

N/A

SPECIAL NOTES FOR UTILITY CLEARANCE

IMPACT ON CONSTRUCTION

TRIGG COUNTY NHPP BRO 0801 (101)
FD52 111 51382
CADIZ-AURORA BRIDGE OVER LAKE BARKLEY
SIX YEAR PLAN ITEM NUMBER 01-180.60

THE FOLLOWING COMPANIES HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE COMPANY OR THE COMPANY'S SUBCONTRACTOR AND IS TO BE COORDINATED WITH THE ROAD CONTRACT

Pennyrile Electric has a distribution line that supplies the power to the lighting on the existing bridge and must be maintained until such time that the structure has been removed as a hazard to navigation. The electric distribution line supplying the power to the bridge will have to be relocated temporarily in order to accommodate the construction phasing on this project. The contractor must coordinate the relocation of the power line with Pennyrile Electric.

Mediacom has service that crosses the main line at Arrowhead Trail that will have to be relocated.

AT&T has a Fiber routes along this project. The relocation of this fiber must be coordinated with AT&T in order to maintain this utility across the lake until such time that the new service may be placed on the proposed new bridge.

Barkley Lake Water District has a water main within the limits of the project that has not been relocated. This water main is located at approximate STA 3190+60 crossing the existing roadway at Arrowhead Trail as well as extending East along the North Existing R/W of US 68/KY 80 to approximate STA. 3202+00. The relocation of this waterline must be coordinated with BLWD.

(NOTE: Use the following Text Only If Applicable) The Department will consider submission of a bid as the Contractor's agreement to not make any claims for additional compensation due to delays or other conditions created by the operations of (Utility Company(s) Name). Working days will not be charged for those days on which work on (Utility Company(s) Name) facilities is delayed, as provided in the current edition of the KY Standard Specifications for Road and Bridge Construction. Should a difference of opinion arise as to the rights of the Contractor and others working within the limits of, or adjacent to the project, the KYTC Resident Engineer will decide as to the respective rights of the various parties involved in order to assure the completion of the Department's work in general harmony and in a satisfactory manner, and his decision shall be final and binding upon the Contractor. .

THE FOLLOWING COMPANIES HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE ROAD CONTRACTOR AS INCLUDED IN THIS CONTRACT

The roadway contractor will be installing the conduits and pull boxes for AT&T and Pennyrile on the new structure crossing Lake Barkley from bridge end to bridge end. Coordination with these utility companies

SPECIAL NOTES FOR UTILITY CLEARANCE

IMPACT ON CONSTRUCTION

TRIGG COUNTY NHPP BRO 0801 (101)

FD52 111 51382

CADIZ-AURORA BRIDGE OVER LAKE BARKLEY

SIX YEAR PLAN ITEM NUMBER 01-180.60

will be required so that the transfer of the services from the old structure to the new structure can be completed without causing delays to the removal of the old structure and causeways.

SPECIAL CAUTION NOTE – PROTECTION OF UTILITIES

The contractor will be responsible for contacting all utility facility owners on the subject project to coordinate his activities. The contractor will coordinate his activities to minimize and, where possible, avoid conflicts with utility facilities. Due to the nature of the work proposed, it is unlikely to conflict with the existing utilities beyond minor facility adjustments. Where conflicts with utility facilities are unavoidable, the contractor will coordinate any necessary relocation work with the facility owner and Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs.

The utility facilities as noted in the previous section(s) have been determined using data garnered by varied means and with varying degrees of accuracy: from the facility owners, a result of S.U.E., field inspections, and/or reviews of record drawings. The facilities defined may not be inclusive of all utilities in the project scope and are not Level A quality, unless specified as such. It is the contractor's responsibility to verify all utilities and their respective locations before excavating.

BEFORE YOU DIG

The contractor is instructed to call 1-800-752-6007 to reach KY 811, the one-call system for information on the location of existing underground utilities. The call is to be placed a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor should be aware that owners of underground facilities are not required to be members of the KY 811 one-call Before-U-Dig (BUD) service. The contractor must coordinate excavation with the utility owners, including those whom do not subscribe to KY 811. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area.

Please Note: The information presented in this Utility Note is informational in nature and the information contained herein is not guaranteed.

SPECIAL NOTES FOR UTILITY CLEARANCE
IMPACT ON CONSTRUCTION

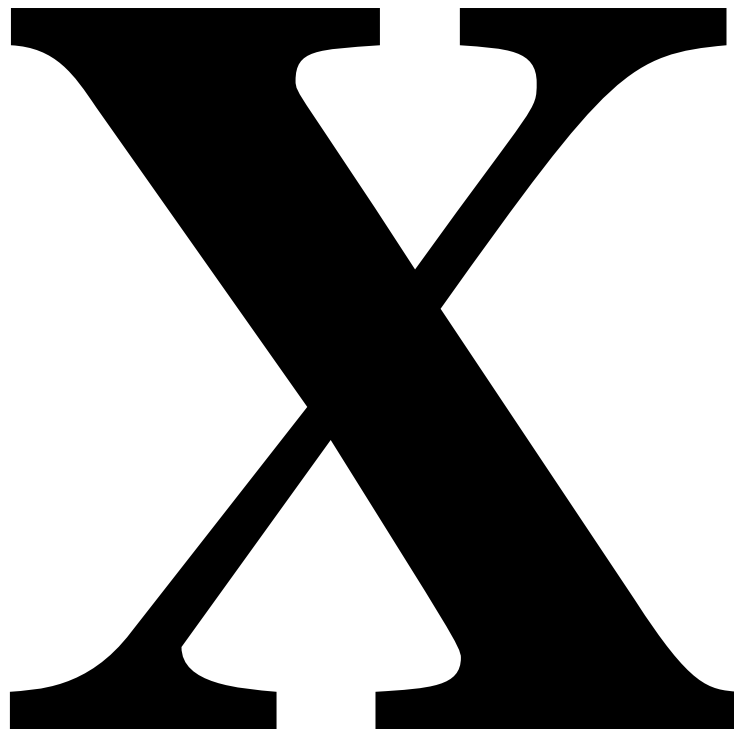
TRIGG COUNTY NHPP BRO 0801 (101)
FD52 111 51382
CADIZ-AURORA BRIDGE OVER LAKE BARKLEY
SIX YEAR PLAN ITEM NUMBER 01-180.60

AREA UTILITIES CONTACT LIST

<u>Utility Company/Agency</u>	<u>Contact Name</u>	<u>Contact Information</u>
<u>Barkley Water</u>	Terry Goins	270 522-8425
<u>Pennyrile Electric</u>	Eston Glover	270 886-2555
<u>AT&T</u>	Neal Lindsey	270 444-5047
<u>Mediacom</u>	Albert Gaboriault	270 527-9939

DEPARTMENT OF THE ARMY/NATIONWIDE PERMIT

**THIS PAGE IS A PLACEHOLDER FOR THE DEPARTMENT OF THE
ARMY/NATIONWIDE PERMIT.**



N O T I C E

**DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
(INDIVIDUAL WQC AUTHORIZATION)**

PROJECT: Trigg County, Item No. 1-180.60
Bridge Replacement

The Section 401 activities for this project have been previously permitted under the authority of the Division of Water Individual Water Quality Certification. In order for these authorizations to be valid, the attached conditions must be followed. The contractor shall post a copy of this Individual WQC in a conspicuous location at the project site for the duration of construction and comply with the general conditions as required.

To more readily expedite construction, the contractor may elect to alter the design or perform the work in a manner different from what was originally proposed and specified. Prior to commencing such alternative work, the contractor shall obtain **written** permission from the Division of Construction and the Corps of Engineers. A copy of any request to the Corps of Engineers to alter this proposal and subsequent responses shall be forwarded to the Division of Environmental Analysis, DA Permit Coordinator, for office records and for informational purposes.



STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET

DEPARTMENT FOR ENVIRONMENTAL PROTECTION

DIVISION OF WATER

200 FAIR OAKS LANE, 4TH FLOOR

FRANKFORT, KENTUCKY 40601

www.kentucky.gov

September 5, 2014

David Waldner, Director
Kentucky Transportation Cabinet
200 Mero Street, 5th Floor
Frankfort, KY 40622

Re: Water Quality Certification #WQC 2014-051-1
US 68/KY80 Over Lake Barkley - Trigg Co
KYTC Item No. 1-180.60
AI No.: 6816
Activity ID: APE20140001
Trigg County, Kentucky

Dear Mr. Waldner:

Pursuant to Section 401 of the Clean Water Act (CWA), the Commonwealth of Kentucky certifies it has reasonable assurances that applicable water quality standards under Kentucky Administrative Regulations Title 401, Chapter 10, established pursuant to Sections 301, 302, 303, 304, 306, and 307 of the CWA, will not be violated by the above referenced project provided that the U.S. Army Corps of Engineers authorizes the activity under 33 CFR part 330, and the attached conditions are met.

All future correspondence on this project must reference **AI No. 6816**. **The attached document is your official Water Quality Certification; please read it carefully.** If you should have any questions concerning the conditions of this water quality certification, please contact James Bicknell of my staff by calling (502) 564-3410.

Sincerely,

A handwritten signature in black ink, appearing to read "Adam Jackson", with a stylized flourish extending to the right.

Adam Jackson, Supervisor
Water Quality Certification Section
Kentucky Division of Water

AJ:JB

Attachment

cc: Amy Robison, USACE: Nashville District
Roy Collins, KYTC DEA

KTC Water Quality Certification

US 68 - Trigg Co
Facility Requirements
Permit Number:WQC 2014-051-1
Activity ID No.: APE20140001

Page 1 of 2

ACTV0000000005 (KYTC 1-180.60) Lake Barkley Bridge:

Submittal/Action Requirements:

Condition No.	Condition
S-1	The Kentucky Transportation Cabinet (KYTC) must notify the Division: Due prior to any construction activity. Notify the Water Quality Certification (WQC) Section of the Kentucky Division of Water (KDOW) at (502) 564-3410 at least two weeks prior to construction. [Clean Water Act]
S-2	The KYTC must notify the Division: Due when construction is complete. Notify the WQC Section of the KDOW at (502) 564-3410 no later than two weeks post construction. [Clean Water Act]

Narrative Requirements:

Condition No.	Condition
T-1	The work approved by this certification shall be limited to: - the loss of 750 linear feet of ephemeral stream channel due to bridge construction - the loss of 0.97 acres of open waterbody due to the construction of the Causeway - the loss of 0.33 acres of open waterbody due to the construction of the Bridge Piers (approach spans and main span). [Clean Water Act]
T-2	All work performed under this certification shall adhere to the design and specifications set forth in the application package titled " US 68/KY80 Over Lake Barkley 1-180.60" received by KDOW on April 4th, 2014. [Clean Water Act]
T-3	The KYTC is responsible for preventing degradation of waters of the Commonwealth from soil erosion. An erosion and sedimentation control plan must be designed, implemented, and maintained in effective operating condition at all times during construction. [Clean Water Act]
T-4	The Division of Water reserves the right to modify or revoke this certification should it be determined that the activity is in noncompliance with any condition set forth in this certification. [Clean Water Act]
T-5	If construction does not commence within two years of the date of this letter, this certification will become void. A letter requesting a renewal should be submitted. [Clean Water Act]

KTC Water Quality Certification
US 68 - Trigg Co
Facility Requirements
Permit Number:WQC 2014-051-1
Activity ID No.: APE20140001

Page 2 of 2

ACTV0000000005 (continued):

Narrative Requirements:

Condition No.	Condition
T-6	Other permits from the Division of Water may be required for this activity. If this activity occurs within a floodplain, a Permit to Construct Across or Along a Stream may be required. Please contact Todd Powers (502-564-3410) for more information. If the project will disturb one acre or more of land, or is part of a larger common plan of development or sale that will ultimately disturb one acre or more of land, a Kentucky Pollution Discharge Elimination System (KPDES) stormwater permit shall be required from the Surface Water Permits Branch. This permit requires the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must include erosion prevention and sediment control measures. Contact: Surface Water Permits Branch (SWPB) Support (502-564-3410 or SWPBsupport@ky.gov). [Clean Water Act]
T-7	Dredging work shall not be conducted during the fish spawning season, April 15th through June 15th. [Clean Water Act]
T-8	Mitigation for impacts shall begin prior to or concurrently with impacts. [Clean Water Act]
T-9	Check dams are not allowed within the stream channel. [Clean Water Act]
T-10	Remove all sediment and erosion control measures after re-vegetation has become well-established. [Clean Water Act]



STEPHEN L.
BESHEAR
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

LEONARD K. PETERS
SECRETARY

ATTENTION APPLICANT

If your project involves one or more of the following activities, you may need more than one permit from the Kentucky Division of Water.

- *building in a floodplain**
- *road culvert in a stream**
- *streambank stabilization**
- *stream cleanup**
- *utility line crossing a stream**
- *construction sites an acre or more**

- If the project will disturb one acre or more of land, or is part of a larger common plan of development or sale that will ultimately disturb one acre or more of land, a Kentucky Pollution Discharge Elimination System (KPDES) stormwater permit shall be required from the Operational Permits Section. This permit requires the creation of an erosion control plan.

Contact Allen Ingram.

- Projects that involve filling in the floodplain will require a stream construction permit from the Floodplain Management Section.

Contact Todd Powers.

- Projects that involve work IN a stream, such as bank stabilization, road culverts, utility line crossings, and stream alteration will require a stream construction permit and a Water Quality Certification from the Water Quality Certification Section.

Contact Barbara Scott.

All three contacts listed above can be reached at 502/564-3410. A complete listing of environmental programs administered by the Kentucky Department for Environmental Protection is available from Pete Goodman by calling 502/564-3410.

GENERAL CONDITIONS FOR WATER QUALITY CERTIFICATION

1. The Kentucky Division of Water may require submission of a formal application for an Individual Certification for any project if the project has been determined to likely have a significant adverse effect upon water quality or degrade the waters of the Commonwealth so that existing uses of the water body or downstream waters are precluded.
2. Nationwide permits issued by the U.S. Army Corps of Engineers for projects in Outstanding State Resource Waters, Cold Water Aquatic Habitats, and Exceptional Waters as defined by 401 KAR 10:026 shall require individual water quality certifications.
3. Erosion and sedimentation pollution control plans and Best Management Practices must be designed, installed, and maintained in effective operating condition at all times during construction activities so that violations of state water quality standards do not occur.
4. Sediment and erosion control measures (e.g., check-dams, silt fencing, or hay bales) shall not be placed within surface waters of the Commonwealth, either temporarily or permanently, without prior approval by the Kentucky Division of Water's Water Quality Certification Section. If placement of sediment and erosion control measures in surface waters is unavoidable, placement shall not be conducted in such a manner that may cause instability of streams that are adjacent to, upstream, or downstream of the structures. All sediment and erosion control measures shall be removed and the natural grade restored prior to withdrawal from the site.
5. Measures shall be taken to prevent or control spills of fuels, lubricants, or other toxic materials used in construction from entering the watercourse.
6. To the maximum extent practicable, all in-stream work under this certification shall be performed during low flow.
7. Heavy equipment (e.g. bulldozers, backhoes, draglines, etc.), if required for this project, should not be used or operated within the stream channel. In those instances where such in-stream work is unavoidable, then it shall be performed in such a manner and duration as to minimize re-suspension of sediments and disturbance to the channel, banks, or riparian vegetation.
8. If there are water supply intakes located downstream that may be affected by increased turbidity, the permittee shall notify the operator when work will be performed.
9. Removal of existing riparian vegetation should be restricted to the minimum necessary for project construction.
10. Should stream pollution, wetland impairment, and/or violations of water quality standards occur as a result of this activity (either from a spill or other forms of water pollution), the Kentucky Division of Water shall be notified immediately by calling 800/564-2380.

KyTC BMP Plan for Project PCN ## - #####



Kentucky Transportation Cabinet

Highway District 1

And

_____ **(2), Construction**

Kentucky Pollutant Discharge Elimination System

Permit KYR10

Best Management Practices (BMP) plan

Groundwater protection plan

For Highway Construction Activities

For

Replace bridge and approaches over Lake Barkley

on US 68/KY 80

Trigg County, Kentucky

Project: PCN ## - #####

KyTC BMP Plan for Project PCN ## -

Project information

Note – (1) = Design (2) = Construction (3) = Contractor

1. Owner – Kentucky Transportation Cabinet, District 1
2. Resident Engineer: (2)
3. Contractor name: (2)
Address: (2)

Phone number: (2)
Contact: (2)
Contractors agent responsible for compliance with the KPDES permit requirements (3):
4. Project Control Number (2)
5. Route (Address) US 68/KY 80
6. Latitude/Longitude (project mid-point) 36^48'00"N, 87^58'33"W
7. County (project mid-point) Trigg
8. Project start date (date work will begin): (2)
9. Projected completion date: (2)

KyTC BMP Plan for Project PCN ## -

A. Site description:

1. Nature of Construction Activity (from letting project description): Bridge and approach replacement
2. Order of major soil disturbing activities (2) and (3)
3. Projected volume of material to be moved: 123,441 cubic yards
4. Estimate of total project area (acres): 22.78 acres
5. Estimate of area to be disturbed (acres): 22.78 acres
6. Post construction runoff coefficient will be included in the project drainage folder. Persons needing information pertaining to the runoff coefficient will contact the resident engineer to request this information.
7. Data describing existing soil condition: The majority of soil horizons and slopes on this project are subject to erosion.
8. Data describing existing discharge water quality (if any): There is no information for this item.
9. Receiving water name: Lake Barkley/Cumberland River
10. TMDLs and Pollutants of Concern in Receiving Waters: No TMDLs were involved on this project.
11. Site map – Project layout sheet plus the erosion control sheets in the project plans that depict Disturbed Drainage Areas (DDAs) and related information. These sheets depict the existing project conditions with areas delineated by DDA (drainage area bounded by watershed breaks and right of way limits), the storm water discharge locations (either as a point discharge or as overland flow) and the areas that drain to each discharge point. These plans define the limits of areas to be disturbed and the location of control measures. Controls will be either site specific as designated by the designer or will be annotated by the contractor and resident engineer before disturbance commences. The project layout sheet shows the surface waters and wetlands.
12. Potential sources of pollutants:

KyTC BMP Plan for Project PCN ## -

The primary source of pollutants is solids that are mobilized during storm events. Other sources of pollutants include oil/fuel/grease from servicing and operating construction equipment, concrete washout water, sanitary wastes and trash/debris. (3)

B. Sediment and Erosion Control Measures:

1. Plans for highway construction projects will include erosion control sheets that depict Disturbed Drainage Areas (DDAs) and related information. These plan sheets will show the existing project conditions with areas delineated by DDA within the right of way limits, the discharge points and the areas that drain to each discharge point. Project managers and designers will analyze the DDAs and identify Best Management Practices (BMPs) that are site specific. The balance of the BMPs for the project will be listed in the bid documents for selection and use by the contractor on the project with approval by the resident engineer.

Projects that do not have DDAs annotated on the erosion control sheets will employ the same concepts for development and managing BMP plans.

2. Following award of the contract, the contractor and resident engineer will annotate the erosion control sheets showing location and type of BMPs for each of the DDAs that will be disturbed at the outset of the project. This annotation will be accompanied by an order of work that reflects the order or sequence of major soil moving activities. The remaining DDAs are to be designated as "Do Not Disturb" until the contractor and resident engineer prepare the plan for BMPs to be employed. The initial BMP's shall be for the first phase (generally Clearing and Grubbing) and shall be modified as needed as the project changes phases. The BMP Plan will be modified to reflect disturbance in additional DDA's as the work progresses. All DDA's will have adequate BMP's in place before being disturbed.
3. As DDAs are prepared for construction, the following will be addressed for the project as a whole or for each DDA as appropriate:
 - Construction Access – This is the first land-disturbing activity. As soon as construction begins, bare areas will be stabilized with gravel and temporary mulch and/or vegetation.
 - At the beginning of the project, all DDAs for the project will be inspected for areas that are a source of storm water pollutants. Areas that are a source of pollutants will receive appropriate cover

KyTC BMP Plan for Project PCN ## -

or BMPs to arrest the introduction of pollutants into storm water. Areas that have not been opened by the contractor will be inspected periodically (once per month) to determine if there is a need to employ BMPs to keep pollutants from entering storm water.

- Clearing and Grubbing – The following BMP's will be considered and used where appropriate.
 - Leaving areas undisturbed when possible.
 - Silt basins to provide silt volume for large areas.
 - Silt Traps Type A for small areas.
 - Silt Traps Type C in front of existing and drop inlets which are to be saved
 - Diversion ditches to catch sheet runoff and carry it to basins or traps or to divert it around areas to be disturbed.
 - Brush and/or other barriers to slow and/or divert runoff.
 - Silt fences to catch sheet runoff on short slopes. For longer slopes, multiple rows of silt fence may be considered.
 - Temporary Mulch for areas which are not feasible for the fore mentioned types of protections.
 - Non-standard or innovative methods.
- Cut & Fill and placement of drainage structures - The BMP Plan will be modified to show additional BMP's such as:
 - Silt Traps Type B in ditches and/or drainways as they are completed
 - Silt Traps Type C in front of pipes after they are placed
 - Channel Lining
 - Erosion Control Blanket
 - Temporary mulch and/or seeding for areas where construction activities will be ceased for 21 days or more.
 - Non-standard or innovative methods
- Profile and X-Section in place – The BMP Plan will be modified to show elimination of BMP's which had to be removed and the addition of new BMP's as the roadway was shaped. Probably changes include:
 - Silt Trap Type A, Brush and/or other barriers, Temporary Mulch, and any other BMP which had to be removed for final grading to take place.
 - Additional Silt Traps Type B and Type C to be placed as final drainage patterns are put in place.
 - Additional Channel Lining and/or Erosion Control Blanket.
 - Temporary Mulch for areas where Permanent Seeding and Protection cannot be done within 21 days.
 - Special BMP's such as Karst Policy
- Finish Work (Paving, Seeding, Protect, etc.) – A final BMP Plan will result from modifications during this phase of construction. Probably changes include:

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- Removal of Silt Traps Type B from ditches and drainways if they are protected with other BMP's which are sufficient to control erosion, i.e. Erosion Control Blanket or Permanent Seeding and Protection on moderate grades.
- Permanent Seeding and Protection
- Placing Sod
- Planting trees and/or shrubs where they are included in the project

C. Other Control Measures

1. No solid materials, including building materials, shall be discharged to waters of the commonwealth, except as authorized by a Section 404 permit.

2. Waste Materials

All waste materials that may leach pollutants (paint and paint containers, caulk tubes, oil/grease containers, liquids of any kind, soluble materials, etc.) will be collected and stored in appropriate covered waste containers. Waste containers shall be removed from the project site on a sufficiently frequent basis as to not allow wastes to become a source of pollution. All personnel will be instructed regarding the correct procedure for waste disposal. Wastes will be disposed in accordance with appropriate regulations. Notices stating these practices will be posted in the office.

3. Hazardous Waste

All hazardous waste materials will be managed and disposed of in the manner specified by local or state regulation. The contractor shall notify the Resident Engineer if there any hazardous wastes being generated at the project site and how these wastes are being managed. Site personnel will be instructed with regard to proper storage and handling of hazardous wastes when required. The Transportation Cabinet will file for generator, registration when appropriate, with the Division of Waste Management and advise the contractor regarding waste management requirements.

4. Spill Prevention

The following material management practices will be used to reduce the risk of spills or other exposure of materials and substances to the weather and/or runoff.

➤ **Good Housekeeping:**

KyTC BMP Plan for Project PCN ## -

The following good housekeeping practices will be followed onsite during the construction project.

- An effort will be made to store only enough product required to do the job
- All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure
- Products will be kept in their original containers with the original manufacturer's label
- Substances will not be mixed with one another unless recommended by the manufacturer
- Whenever possible, all of the product will be used up before disposing of the container
- Manufacturers' recommendations for proper use and disposal will be followed
- The site contractor will inspect daily to ensure proper use and disposal of materials onsite

➤ **Hazardous Products:**

These practices will be used to reduce the risks associated with any and all hazardous materials.

- Products will be kept in original containers unless they are not resealable
- Original labels and material safety data sheets (MSDS) will be reviewed and retained
- Contractor will follow procedures recommended by the manufacturer when handling hazardous materials
- If surplus product must be disposed of, manufacturers' or state/local recommended methods for proper disposal will be followed

The following product-specific practices will be followed onsite:

➤ **Petroleum Products:**

Vehicles and equipment that are fueled and maintained on site will be monitored for leaks, and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products onsite will be stored in tightly sealed containers, which are clearly labeled and will be protected from exposure to weather.

The contractor shall prepare an Oil Pollution Spill Prevention Control and Countermeasure plan when the project that involves the storage of petroleum products in 55 gallon or larger containers with a total combined storage capacity of 1,320 gallons. This is a requirement of 40 CFR 112.

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This project (will / will not) (3) have over 1,320 gallons of petroleum products with a total capacity, sum of all containers 55 gallon capacity and larger.

➤ **Fertilizers:**

Fertilizers will be applied at rates prescribed by the contract, standard specifications or as directed by the resident engineer. Once applied, fertilizer will be covered with mulch or blankets or worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

➤ **Paints:**

All containers will be tightly sealed and stored indoors or under roof when not being used. Excess paint or paint wash water will not be discharged to the drainage or storm sewer system but will be properly disposed of according to manufacturers' instructions or state and local regulations.

➤ **Concrete Truck Washout:**

Concrete truck mixers and chutes will not be washed on pavement, near storm drain inlets, or within 75 feet of any ditch, stream, wetland, lake, or sinkhole. Where possible, excess concrete and wash water will be discharged to areas prepared for pouring new concrete, flat areas to be paved that are away from ditches or drainage system features, or other locations that will not drain off site. Where this approach is not possible, a shallow earthen wash basin will be excavated away from ditches to receive the wash water

➤ **Spill Control Practices**

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup:

- Manufacturers' recommended methods for spill cleanup will be clearly posted. All personnel will be made aware of procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area. Equipment and materials will include as appropriate, brooms, dust pans, mops, rags, gloves, oil absorbents, sand, sawdust, and plastic and metal trash containers.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.

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- Spills of toxic or hazardous material will be reported to the appropriate state/local agency as required by KRS 224 and applicable federal law.
- The spill prevention plan will be adjusted as needed to prevent spills from reoccurring and improve spill response and cleanup.
- Spills of products will be cleaned up promptly. Wastes from spill clean up will be disposed in accordance with appropriate regulations.

D. Other State and Local Plans

This BMP plan shall include any requirements specified in sediment and erosion control plans, storm water management plans or permits that have been approved by other state or local officials. Upon submittal of the NOI, other requirements for surface water protection are incorporated by reference into and are enforceable under this permit (even if they are not specifically included in this BMP plan). This provision does not apply to master or comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit issued for the construction site by state or local officials.

E. Maintenance

1. The BMP plan shall include a clear description of the maintenance procedures necessary to keep the control measures in good and effective operating condition.
- Maintenance of BMPs during construction shall be a result of weekly and post rain event inspections with action being taken by the contractor to correct deficiencies.
 - Post Construction maintenance will be a function of normal highway maintenance operations. Following final project acceptance by the cabinet, district highway crews will be responsible for identification and correction of deficiencies regarding ground cover and cleaning of storm water BMPs. The project manager shall identify any BMPs that will be for the purpose of post construction storm water management with specific guidance for any non-routine maintenance.

F. Inspections

Inspection and maintenance practices that will be used to maintain erosion and sediment controls:

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- All erosion prevention and sediment control measures will be inspected at least once each week and following any rain of one-half inch or more.
- Inspections will be conducted by individuals that have received KyTC Grade Level II training or other qualification as prescribed by the cabinet that includes instruction concerning sediment and erosion control.
- Inspection reports will be written, signed, dated, and kept on file.
- Areas at final grade will be seeded and mulched within 14 days.
- Areas that are not at final grade where construction has ceased for a period of 21 days or longer and soil stock piles shall receive temporary mulch no later than 14 days from the last construction activity in that area.
- All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours of being reported.
- Built-up sediment will be removed from behind the silt fence before it has reached halfway up the height of the fence.
- Silt fences will be inspected for bypassing, overtopping, undercutting, depth of sediment, tears, and to ensure attachment to secure posts.
- Sediment basins will be inspected for depth of sediment, and built-up sediment will be removed when it reaches 70 percent of the design capacity and at the end of the job.
- Diversion dikes and berms will be inspected and any breaches promptly repaired. Areas that are eroding or scouring will be repaired and re-seeded / mulched as needed.
- Temporary and permanent seeding and mulching will be inspected for bare spots, washouts, and healthy growth. Bare or eroded areas will be repaired as needed.
- All material storage and equipment servicing areas that involve the management of bulk liquids, fuels, and bulk solids will be inspected weekly for conditions that represent a release or possible release of pollutants to the environment.

G. Non – Storm Water discharges

It is expected that non-storm water discharges may occur from the site during the construction period. Examples of non-storm water discharges include:

- Water from water line flushings.
- Water from cleaning concrete trucks and equipment.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).

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- Uncontaminated groundwater and rain water (from dewatering during excavation).

All non-storm water discharges will be directed to the sediment basin or to a filter fence enclosure in a flat vegetated infiltration area or be filtered via another approved commercial product.

H. Groundwater Protection Plan (3)

This plan serves as the groundwater protection plan as required by 401 KAR 5:037.

- Contractors statement: (3)

The following activities, as enumerated by 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan, will or may be may be conducted as part of this construction project:

_____ 2. (e) land treatment or land disposal of a pollutant;

_____ 2. (f) Storing, ..., or related handling of hazardous waste, solid waste or special waste, ..., in tanks, drums, or other containers, or in piles, (This does not include wastes managed in a container placed for collection and removal of municipal solid waste for disposal off site);

_____ 2. (g) Handling of materials in bulk quantities (equal or greater than 55 gallons or 100 pounds net dry weight transported held in an individual container) that, if released to the environment, would be a pollutant;

_____ 2. (j) Storing or related handling of road oils, dust suppressants,, at a central location;

_____ 2. (k) Application or related handling of road oils, dust suppressants or deicing materials, (does not include use of chloride-based deicing materials applied to roads or parking lots);

_____ 2. (m) Installation, construction, operation, or abandonment of wells, bore holes, or core holes, (this does not include bore holes for the purpose of explosive demolition);

Or, check the following only if there are no qualifying activities

_____ There are no activities for this project as listed in 401 KAR 5:037 Section 2 that require the preparation and implementation of a groundwater protection plan.

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The contractor is responsible for the preparation of a plan that addresses the

401 KAR 5:037 Section 3. (3) Elements of site specific groundwater protection plan:

- (a) General information about this project is covered in the Project information;
- (b) Activities that require a groundwater protection plan have been identified above;
- (c) Practices that will protect groundwater from pollution are addressed in section C. Other control measures.
- (d) Implementation schedule – all practices required to prevent pollution of groundwater are to be in place prior to conducting the activity;
- (e) Training is required as a part of the ground water protection plan. All employees of the contractor, sub-contractor and resident engineer personnel will be trained to understand the nature and requirements of this plan as they pertain to their job function(s). Training will be accomplished within one week of employment and annually thereafter. A record of training will be maintained by the contractor with a copy provide to the resident engineer.
- (f) Areas of the project and groundwater plan activities will be inspected as part of the weekly sediment and erosion control inspections
- (g) Certification (see signature page.)

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Sub-Contractor Certification

The following sub-contractor shall be made aware of the BMP plan and responsible for implementation of BMPs identified in this plan as follows:

Subcontractor

Name:
Address:
Address:

Phone:

The part of BMP plan this subcontractor is responsible to implement is:

I certify under penalty of law that I understand the terms and conditions of the general Kentucky Pollutant Discharge Elimination System permit that authorizes the storm water discharges, the BMP plan that has been developed to manage the quality of water to be discharged as a result of storm events associated with the construction site activity and management of non-storm water pollutant sources identified as part of this certification.

Signed _____title_____, _____
Typed or printed name¹signature

1. Sub Contractor Note: to be signed by a person who is the owner, a responsible corporate officer, a general partner or the proprietor or a person designated to have the authority to sign reports by such a person in accordance with 401 KAR 5:060 Section 9. This delegation shall be in writing to: Manager, KPDES Branch, Division of Water, 14 Reilly Road, Frankfort Kentucky 40601. Reference the Project Control Number (PCN) and KPDES number when one has been issued.



STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

July 25, 2014

Michael McGregor
US 68 Bridge - Trigg Co
5501 Kentucky Dam Rd
Paducah, KY 42003

Re: KYR10 Coverage Acknowledgment
KPDES No.: [KYR10I594](#)
[Lake Barkley Bridge - Trigg Co](#)
Permit Type: [Construction](#)
AI ID: [123236](#)
[Trigg County, Kentucky](#)

Dear [Michael McGregor](#):

The discharges associated with the Notice of Intent you submitted have been approved for coverage under the "Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Stormwater Discharges Associated with Construction Activities (KYR10)" permit. This coverage becomes effective the date of this correspondence and will remain effective until the general permit expires or the Division of Water revokes coverage. During this period of coverage all discharges shall comply with the conditions of the applicable general permit. A copy of the general permit the operator is now covered by can be found on our website: <http://water.ky.gov>.

Any questions concerning the general permit and its requirements should be directed to me at (502) 564-3410.

Facility Site: 36.799875, -87.975809

Sincerely,

A handwritten signature in black ink, appearing to read "Shawn Hokanson", with a long horizontal flourish extending to the right.

Shawn Hokanson
Surface Water Permits Branch
Division of Water

**SPECIAL NOTE FOR PRE-BID CONFERENCE
CID Number - 141279**

The Department will conduct a Pre-Bid Conference of the subject project on
Tuesday, December 2, 2014 at 1:30 PM Eastern Standard Time at:

**Capital Plaza Hotel
Ballrooms 1 and 2
405 Wilkinson Blvd
Frankfort, KY 40601
Phone: (502) 227-5100**

Any company that is interested in bidding on the subject project or being part of a joint venture shall be represented at the conference by at least **one person of sufficient authority to bind the company**. No individual can represent more than one company. At the conference a roster shall be taken of the representatives present. **Only companies represented at the conference will be eligible to have their bids opened at the date of letting.**

The purpose of the conference is to familiarize the prospective bidders with the contract requirements.

Department of Highways officials present at the conference will answer questions concerning the projects.

PART II

SPECIFICATIONS AND STANDARD DRAWINGS

SPECIFICATIONS REFERENCE

Any reference in the plans or proposal to previous editions of the *Standard Specifications for Road and Bridge Construction* and *Standard Drawings* are superseded by *Standard Specifications for Road and Bridge Construction, Edition of 2012* and *Standard Drawings, Edition of 2012 with the 2012 Revision*.

**Supplemental Specifications to the
Standard Specifications for Road and Bridge Construction, 2012 Edition
Effective with the August 22, 2014 Letting**

Subsection:	102.15 Process Agent.
Revision:	Replace the 1st paragraph with the following: Every corporation doing business with the Department shall submit evidence of compliance with KRS Sections 14A.4-010, 271B.11-010, 271B.11-070, 271B.11-080, 271B.5-010 and 271B.16-220, and file with the Department the name and address of the process agent upon whom process may be served.
Subsection:	105.13 Claims Resolution Process.
Revision:	Delete all references to TC 63-34 and TC 63-44 from the subsection as these forms are no longer available through the forms library and are forms generated within the AASHTO SiteManager software.
Subsection:	108.03 Preconstruction Conference.
Revision:	Replace 8) Staking with the following: 8) Staking (designated by a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.
Subsection:	109.07.02 Fuel.
Revision:	Revise item Crushed Aggregate Used for Embankment Stabilization to the following: Crushed Aggregate Used for Stabilization of Unsuitable Materials Used for Embankment Stabilization
	Delete the following item from the table. Crushed Sandstone Base (Cement Treated)
Subsection:	110.02 Demobilization.
Revision:	Replace the first part of the first sentence of the second paragraph with the following: Perform all work and operations necessary to accomplish final clean-up as specified in the first paragraph of Subsection 105.12;
Subsection:	112.03.12 Project Traffic Coordinator (PTC).
Revision:	Replace the last paragraph of this subsection with the following: Ensure the designated PTC has sufficient skill and experience to properly perform the task assigned and has successfully completed the qualification courses.
Subsection:	112.04.18 Diversions (By-Pass Detours).
Revision:	Insert the following sentence after the 2nd sentence of this subsection. The Department will not measure temporary drainage structures for payment when the contract documents provide the required drainage opening that must be maintained with the diversion. The temporary drainage structures shall be incidental to the construction of the diversion. If the contract documents fail to provide the required drainage opening needed for the diversion, the cost of the temporary drainage structure will be handled as extra work in accordance with section 109.04.
Subsection:	201.03.01 Contractor Staking.
Revision:	Replace the first paragraph with the following: Perform all necessary surveying under the general supervision of a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.

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Subsection:	201.04.01 Contractor Staking.
Revision:	Replace the last sentence of the paragraph with the following: Complete the general layout of the project under the supervision of a Professional Engineer or Land Surveyor licensed in the Commonwealth of Kentucky.
Subsection:	206.04.01 Embankment-in-Place.
Revision:	Replace the fourth paragraph with the following: The Department will not measure suitable excavation included in the original plans that is disposed of for payment and will consider it incidental to Embankment-in-Place.
Subsection:	208.02.01 Cement.
Revision:	Replace paragraph with the following: Select Type I or Type II cement conforming to Section 801. Use the same type cement throughout the work.
Subsection:	208.03.06 Curing and Protection.
Revision:	Replace the fourth paragraph with the following: Do not allow traffic or equipment on the finished surface until the stabilized subgrade has cured for a total of 7-days with an ambient air temperature above 40 degrees Fahrenheit. A curing day consists of a continuous 24-hour period in which the ambient air temperature does not fall below 40 degrees Fahrenheit. Curing days will not be calculated consecutively, but must total seven (7) , 24-hour days with the ambient air temperature remaining at or above 40 degrees Fahrenheit before traffic or equipment will be allowed to traverse the stabilized subgrade. The Department may allow a shortened curing period when the Contractor requests. The Contractor shall give the Department at least 3 day notice of the request for a shortened curing period. The Department will require a minimum of 3 curing days after final compaction. The Contractor shall furnish cores to the treated depth of the roadbed at 500 feet intervals for each lane when a shortened curing time is requested. The Department will test cores using an unconfined compression test. Roadbed cores must achieve a minimum strength requirement of 80 psi.
Subsection:	208.03.06 Curing and Protection.
Revision:	Replace paragraph eight with the following: At no expense to the Department, repair any damage to the subgrade caused by freezing.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Revision:	Revise Seed Mix Type I to the mixture shown below: 50% Kentucky 31 Tall Fescue (Festuca arundinacea) 35% Hard Fescue (Festuca (Festuca longifolia) 10% Ryegrass, Perennial (Lolium perenne) 5% White Dutch Clover (Trifolium repens)
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Number:	2)
Revision:	Replace the paragraph with the following: Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 4, 5, 6, and 7. Apply seed mix Type II at a minimum application rate of 100 pounds per acre. If adjacent to a golf course replace the crown vetch with Kentucky 31 Tall Fescue.

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Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	A) Seed Mixtures for Permanent Seeding.
Number:	3)
Revision:	Replace the paragraph with the following: Permanent Seeding on Slopes Greater than 3:1 in Highway Districts 1, 2, 3, 8, 9, 10, 11, and 12. Apply seed mix Type III at a minimum application rate of 100 pounds per acre. If adjacent to crop land or golf course, replace the Sericea Lespedeza with Kentucky 31 Fescue.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	B) Procedures for Permanent Seeding.
Revision:	Delete the first sentence of the section.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	B) Procedures for Permanent Seeding.
Revision:	Replace the second and third sentence of the section with the following: Prepare a seedbed and apply an initial fertilizer that contains a minimum of 100 pounds of nitrogen, 100 pounds of phosphate, and 100 pounds of potash per acre. Apply agricultural limestone to the seedbed when the Engineer determines it is needed. When required, place agricultural limestone at a rate of 3 tons per acre.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Top Dressing.
Revision:	Change the title of part to D) Fertilizer.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Fertilizer.
Revision:	Replace the first paragraph with the following: Apply fertilizer at the beginning of the seeding operation and after vegetation is established. Use fertilizer delivered to the project in bags or bulk. Apply initial fertilizer to all areas prior to the seeding or sodding operation at the application rate specified in 212.03.03 B). Apply 20-10-10 fertilizer to the areas after vegetation has been established at a rate of 11.5 pounds per 1,000 square feet. Obtain approval from the Engineer prior to the 2nd fertilizer application. Reapply fertilizer to any area that has a streaked appearance. The reapplication shall be at no additional cost to the Department. Re-establish any vegetation severely damaged or destroyed because of an excessive application of fertilizer at no cost to the Department.
Subsection:	212.03.03 Permanent Seeding and Protection.
Part:	D) Fertilizer.
Revision:	Delete the second paragraph.
Subsection:	212.04.04 Agricultural Limestone.
Revision:	Replace the entire section with the following: The Department will measure the quantity of agricultural limestone in tons.
Subsection:	212.04.05 Fertilizer.
Revision:	Replace the entire section with the following: The Department will measure fertilizer used in the seeding or sodding operations for payment. The Department will measure the quantity by tons.

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Subsection:	212.05 PAYMENT.		
Revision:	Delete the following item code:		
	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
	05966	Topdressing Fertilizer	Ton
Subsection:	212.05 PAYMENT.		
Revision:	Add the following pay items:		
	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
	05963	Initial Fertilizer	Ton
	05964	20-10-10 Fertilizer	Ton
	05992	Agricultural Limestone	Ton
Subsection:	213.03.02 Progress Requirements.		
Revision:	Replace the last sentence of the third paragraph with the following: Additionally, the Department will apply a penalty equal to the liquidated damages when all aspects of the work are not coordinated in an acceptable manner within 7 calendar days after written notification.		
Subsection:	213.03.05 Temporary Control Measures.		
Part:	E) Temporary Seeding and Protection.		
Revision:	Delete the second sentence of the first paragraph.		
Subsection:	304.02.01 Physical Properties.		
Table:	Required Geogrid Properties		
Revision:	Replace all references to Test Method "GRI-GG2-87" with ASTM D 7737.		
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.		
Part:	B) Sampling.		
Revision:	Replace the second sentence with the following: The Department will determine when to obtain the quality control samples using the random-number feature of the mix design submittal and approval spreadsheet. The Department will randomly determine when to obtain the verification samples required in Subsections 402.03.03 and 402.03.04 using the Asphalt Mixture Sample Random Tonnage Generator.		
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.		
Part:	D) Testing Responsibilities.		
Number:	3) VMA.		
Revision:	Add the following paragraph below Number 3) VMA: Retain the AV/VMA specimens and one additional corresponding G _{mm} sample for 5 working days for mixture verification testing by the Department. For Specialty Mixtures, retain a mixture sample for 5 working days for mixture verification testing by the Department. When the Department's test results do not verify that the Contractor's quality control test results are within the acceptable tolerances according to Subsection 402.03.03, retain the samples and specimens from the affected subplot(s) for the duration of the project.		
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.		
Part:	D) Testing Responsibilities.		
Number:	4) Density.		
Revision:	Replace the second sentence of the Option A paragraph with the following: Perform coring by the end of the following work day.		

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Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.
Part:	D) Testing Responsibilities.
Number:	5) Gradation.
Revision:	Delete the second paragraph.
Subsection:	402.03.02 Contractor Quality Control and Department Acceptance.
Part:	H) Unsatisfactory Work.
Number:	1) Based on Lab Data.
Revision:	Replace the second paragraph with the following: When the Engineer determines that safety concerns or other considerations prohibit an immediate shutdown, continue work and the Department will make an evaluation of acceptability according to Subsection 402.03.05.
Subsection:	402.03.03 Verification.
Revision:	Replace the first paragraph with the following: 402.03.03 Mixture Verification. For volumetric properties, the Department will perform a minimum of one verification test for AC, AV, and VMA according to the corresponding procedures as given in Subsection 402.03.02. The Department will randomly determine when to obtain the verification sample using the Asphalt Mixture Sample Random Tonnage Generator. For specialty mixtures, the Department will perform one AC and one gradation determination per lot according to the corresponding procedures as given in Subsection 402.03.02. However, Department personnel will not perform AC determinations according to KM 64-405. The Contractor will obtain a quality control sample at the same time the Department obtains the mixture verification sample and perform testing according to the procedures given in Subsection 402.03.02. If the Contractor's quality control sample is verified by the Department's test results within the tolerances provided below, the Contractor's sample will serve as the quality control sample for the affected subplot. The Department may perform the mixture verification test on the Contractor's equipment or on the Department's equipment.
Subsection:	402.03.03 Verification.
Part:	A) Evaluation of Sublot(s) Verified by Department.
Revision:	Replace the third sentence of the second paragraph with the following: When the paired <i>t</i> -test indicates that the Contractor's data and Department's data are possibly not from the same population, the Department will investigate the cause for the difference according to Subsection 402.03.05 and implement corrective measures as the Engineer deems appropriate.
Subsection:	402.03.03 Verification.
Part:	B) Evaluation of Sublots Not Verified by Department.
Revision:	Replace the third sentence of the first paragraph with the following: When differences between test results are not within the tolerances listed below, the Department will resolve the discrepancy according to Subsection 402.03.05.

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Subsection:	402.03.03 Verification.
Part:	B) Evaluation of Sublots Not Verified by Department.
Revision:	Replace the third sentence of the second paragraph with the following: When the <i>F</i> -test or <i>t</i> -test indicates that the Contractor's data and Department's data are possibly not from the same population, the Department will investigate the cause for the difference according to Subsection 402.03.05 and implement corrective measures as the Engineer deems appropriate.
Subsection:	402.03.03 Verification.
Part:	C) Test Data Patterns.
Revision:	Replace the second sentence with the following: When patterns indicate substantial differences between the verified and non-verified sublots, the Department will perform further comparative testing according to subsection 402.03.05.
Subsection:	402.03 CONSTRUCTION.
Revision:	Add the following subsection: 402.03.04 Testing Equipment and Technician Verification. For mixtures with a minimum quantity of 20,000 tons and for every 20,000 tons thereafter, the Department will obtain an additional verification sample at random using the Asphalt Mixture Sample Random Tonnage Generator in order to verify the integrity of the Contractor's and Department's laboratory testing equipment and technicians. The Department will obtain a mixture sample of at least 150 lb at the asphalt mixing plant according to KM 64-425 and split it according to AASHTO R 47. The Department will retain one split portion of the sample and provide the other portion to the Contractor. At a later time convenient to both parties, the Department and Contractor will simultaneously reheat the sample to the specified compaction temperature and test the mixture for AV and VMA using separate laboratory equipment according to the corresponding procedures given in Subsection 402.03.02. The Department will evaluate the differences in test results between the two laboratories. When the difference between the results for AV or VMA is not within ± 2.0 percent, the Department will investigate and resolve the discrepancy according to Subsection 402.03.05.
Subsection:	402.03.04 Dispute Resolution.
Revision:	Change the subsection number to 402.03.05.
Subsection:	402.05 PAYMENT.
Part:	Lot Pay Adjustment Schedule Compaction Option A Base and Binder Mixtures
Table:	AC
Revision:	Replace the Deviation from JMF(%) that corresponds to a Pay Value of 0.95 to ± 0.6 .
Subsection:	403.02.10 Material Transfer Vehicle (MTV).
Revision:	Replace the first sentence with the following: In addition to the equipment specified above, provide a MTV with the following minimum characteristics:
Subsection:	412.02.09 Material Transfer Vehicle (MTV).
Revision:	Replace the paragraph with the following: Provide and utilize a MTV with the minimum characteristics outlined in section 403.02.10.

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Subsection:	412.03.07 Placement and Compaction.
Revision:	Replace the first paragraph with the following: Use a MTV when placing SMA mixture in the driving lanes. The MTV is not required on ramps and/or shoulders unless specified in the contract. When the Engineer determines the use of the MTV is not practical for a portion of the project, the Engineer may waive its requirement for that portion of pavement by a letter documenting the waiver.
Subsection:	412.04 MEASUREMENT.
Revision:	Add the following subsection: 412.04.03. Material Transfer Vehicle (MTV). The Department will not measure the MTV for payment and will consider its use incidental to the asphalt mixture.
Subsection:	501.03.19 Surface Tolerances and Testing Surface.
Part:	B) Ride Quality.
Revision:	Add the following to the end of the first paragraph: The Department will specify if the ride quality requirements are Category A or Category B when ride quality is specified in the Contract. Category B ride quality requirements shall apply when the Department fails to classify which ride quality requirement will apply to the Contract.
Subsection:	603.03.06 Cofferdams.
Revision:	Replace the seventh sentence of paragraph one with the following: Submit drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky.
Subsection:	605.03.04 Tack Welding.
Revision:	Insert the subsection and the following: 605.03.04 Tack Welding. The Department does not allow tack welding.
Subsection:	606.03.17 Special Requirements for Latex Concrete Overlays.
Part:	A) Existing Bridges and New Structures.
Number:	1) Prewetting and Grout-Bond Coat.
Revision:	Add the following sentence to the last paragraph: Do not apply a grout-bond coat on bridge decks prepared by hydrodemolition.
Subsection:	609.03 Construction.
Revision:	Replace Subsection 609.03.01 with the following: 609.03.01 A) Swinging the Spans. Before placing concrete slabs on steel spans or precast concrete release the temporary erection supports under the bridge and swing the span free on its supports. 609.03.01 B) Lift Loops. Cut all lift loops flush with the top of the precast beam once the beam is placed in the final location and prior to placing steel reinforcement. At locations where lift loops are cut, paint the top of the beam with galvanized or epoxy paint.
Subsection:	611.03.02 Precast Unit Construction.
Revision:	Replace the first sentence of the subsection with the following: Construct units according to ASTM C1577, replacing Table 1 (Design Requirements for Precast Concrete Box Sections Under Earth, Dead and HL-93 Live Load Conditions) with KY Table 1 (Precast Culvert KYHL-93 Design Table) , and Section 605 with the following exceptions and additions:

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Subsection:	613.03.01 Design.
Number:	2)
Revision:	Replace "AASHTO Standard Specifications for Highway Bridges" with "AASHTO LRFD Bridge Design Specifications"
Subsection:	615.06.02
Revision:	Add the following sentence to the end of the subsection. The ends of units shall be normal to walls and centerline except exposed edges shall be beveled $\frac{3}{4}$ inch.
Subsection:	615.06.03 Placement of Reinforcement in Precast 3-Sided Units.
Revision:	Replace the reference of 6.6 in the section to 615.06.06.
Subsection:	615.06.04 Placement of Reinforcement for Precast Endwalls.
Revision:	Replace the reference of 6.7 in the section to 615.06.07.
Subsection:	615.06.06 Laps, Welds, and Spacing for Precast 3-Sided Units.
Revision:	Replace the subsection with the following: Tension splices in the circumferential reinforcement shall be made by lapping. Laps may not be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.2 and AASHTO 2012 Bridge Design Guide Section 5.11.6.3. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.1 and AASHTO 2012 Bridge Design Guide Section 5.11.6.2. The overlap of welded wire fabric shall be measured between the outer most longitudinal wires of each fabric sheet. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.1. For splices other than tension splices, the overlap shall be a minimum of 12" for welded wire fabric or deformed billet-steel bars. The spacing center to center of the circumferential wires in a wire fabric sheet shall be no less than 2 inches and no more than 4 inches. The spacing center to center of the longitudinal wires shall not be more than 8 inches. The spacing center to center of the longitudinal distribution steel for either line of reinforcing in the top slab shall be not more than 16 inches.
Subsection:	615.06.07 Laps, Welds, and Spacing for Precast Endwalls.
Revision:	Replace the subsection with the following: Splices in the reinforcement shall be made by lapping. Laps may not be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.2 and AASHTO 2012 Bridge Design Guide Section 5.11.6.3. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.5.1 and AASHTO 2012 Bridge Design Guide Section 5.11.6.2. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 2012 Bridge Design Guide Section 5.11.2.1. The spacing center-to-center of the wire fabric sheet shall not be less than 2 inches or more than 8 inches.

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Subsection:	615.08.01 Type of Test Specimen.
Revision:	Replace the subsection with the following: Start-up slump, air content, unit weight, and temperature tests will be performed each day on the first batch of concrete. Acceptable start-up results are required for production of the first unit. After the first unit has been established, random acceptance testing is performed daily for each 50 yd ³ (or fraction thereof). In addition to the slump, air content, unit weight, and temperature tests, a minimum of one set of cylinders shall be required each time plastic property testing is performed.
Subsection:	615.08.02 Compression Testing.
Revision:	Delete the second sentence.
Subsection:	615.08.04 Acceptability of Core Tests.
Revision:	Delete the entire subsection.
Subsection:	615.12 Inspection.
Revision:	Add the following sentences to the end of the subsection: Units will arrive at jobsite with the "Kentucky Oval" stamped on the unit which is an indication of acceptable inspection at the production facility. Units shall be inspected upon arrival for any evidence of damage resulting from transport to the jobsite.
Subsection:	716.02.02 Paint.
Revision:	Replace sentence with the following: Conform to Section 821.
Subsection:	716.03 CONSTRUCTION.
Revision:	Replace bullet 5) with the following: 5) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims,
Subsection:	716.03.02 Lighting Standard Installation.
Revision:	Replace the second sentence with the following: Regardless of the station and offset noted, locate all poles/bases behind the guardrail a minimum of four feet from the front face of the guardrail to the front face of the pole base.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	A) Conventional Installation.
Revision:	Replace the third sentence with the following: Orient the transformer base so the door is positioned on the side away from on-coming traffic.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	A) Conventional Installation.
Number:	1) Breakaway Installation and Requirements.
Revision:	Replace the first sentence with the following: For breakaway supports, conform to Section 12 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	B) High Mast Installation
Revision:	Replace the first sentence with the following: Install each high mast pole as noted on plans.
Subsection:	716.03.02 Lighting Standard Installation.
Part:	B) High Mast Installation
Number:	2) Concrete Base Installation
Revision:	Modification of Chart and succeeding paragraphs within this section:

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Drilled Shaft Depth Data							
Level Ground		3:1 Ground Slope		2:1 Ground Slope		1.5:1 Ground Slope ⁽²⁾	
Soil	Rock	Soil	Rock	Soil	Rock	Soil	Rock
17 ft	7 ft	19 ft	7 ft	20 ft	7 ft	⁽¹⁾	7 ft
Steel Requirements							
Vertical Bars		Ties or Spiral					
Size	Total	Size	Spacing or Pitch				
#10	16	#4	12 inch				

(1): Shaft length is 22' for cohesive soil only. For cohesionless soil, contact geotechnical branch for design.

(2): Do not construct high mast drilled shafts on ground slopes steeper than 1.5:1 without the approval of the Division of Traffic.

If rock is encountered during drilling operations and confirmed by the engineer to be of sound quality, the shaft is only required to be further advanced into the rock by the length of rock socket shown in the table. The total length of the shaft need not be longer than that of soil alone. Both longitudinal rebar length and number of ties or spiral length shall be adjusted accordingly.

If a shorter depth is desired for the drilled shaft, the contractor shall provide, for the state's review and approval, a detailed column design with individual site specific soil and rock analysis performed and approved by a Professional Engineer licensed in the Commonwealth of Kentucky.

Spiral reinforcement may be substituted for ties. If spiral reinforcement is used, one and one-half closed coils shall be provided at the ends of each spiral unit. Subsurface conditions consisting of very soft clay or very loose saturated sand could result in soil parameters weaker than those assumed. Engineer shall consult with the geotechnical branch if such conditions are encountered.

The bottom of the drilled hole shall be firm and thoroughly cleaned so no loose or compressible materials are present at the time of the concrete placement. If the drilled hole contains standing water, the concrete shall be placed using a tremie to displace water. Continuous concrete flow will be required to insure full displacement of any water.

The reinforcement and anchor bolts shall be adequately supported in the proper positions so no movement occurs during concrete placement. Welding of anchor bolts to the reinforcing cage is unacceptable, templates shall be used. Exposed portions of the foundation shall be formed to create a smooth finished surface. All forming shall be removed upon completion of foundation construction.

Subsection:	716.03.03 Trenching.
Part:	A) Trenching of Conduit for Highmast Ducted Cables.
Revision:	Add the following after the first sentence: If depths greater than 24 inches are necessary, obtain the Engineer's approval and maintain the required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.

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Subsection:	716.03.03 Trenching.
Part:	B) Trenching of Conduit for Non-Highmast Cables.
Revision:	Add the following after the second sentence: If depths greater than 24 inches are necessary for either situation listed previously, obtain the Engineer's approval and maintain the required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.
Subsection:	716.03.10 Junction Boxes.
Revision:	Replace subsection title with the following: Electrical Junction Box.
Subsection:	716.04.07 Pole with Secondary Control Equipment.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished and installed. The Department will not measure mounting the cabinet to the pole, backfilling, restoration, any necessary hardware to anchor pole, or electrical inspection fees, and will consider them incidental to this item of work. The Department will also not measure furnishing and installing electrical service conductors, specified conduits, meter base, transformer, service panel, fused cutout, fuses, lighting arrestors, photoelectrical control, circuit breaker, contactor, manual switch, ground rods, and ground wires and will consider them incidental to this item of work.
Subsection:	716.04.08 Lighting Control Equipment.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished and installed. The Department will not measure constructing the concrete base, excavation, backfilling, restoration, any necessary anchors, or electrical inspection fees, and will consider them incidental to this item of work. The Department will also not measure furnishing and installing electrical service conductors, specified conduits, meter base, transformer, service panel, fused cutout, fuses, lighting arrestors, photoelectrical control, circuit breakers, contactor, manual switch, ground rods, and ground wires and will consider them incidental to this item of work.
Subsection:	716.04.09 Luminaire.
Revision:	Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed.
Subsection:	716.04.10 Fused Connector Kits.
Revision:	Replace the first sentence with the following: The Department will measure the quantity as each individual unit furnished and installed.
Subsection:	716.04.13 Junction Box.
Revision:	Replace the subsection title with the following: Electrical Junction Box Type Various.
Subsection:	716.04.13 Junction Box.
Part:	A) Junction Electrical.
Revision:	Rename A) Junction Electrical to the following: A) Electrical Junction Box.
Subsection:	716.04.14 Trenching and Backfilling.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, backfilling, underground utility warning tape (if required), the restoration of disturbed areas to original condition, and will consider them incidental to this item of work.

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Subsection:	716.04.18 Remove Lighting.															
Revision:	Replace the paragraph with the following: The Department will measure the quantity as a lump sum for the removal of lighting equipment. The Department will not measure the disposal of all equipment and materials off the project by the contractor. The Department also will not measure the transportation of the materials and will consider them incidental to this item of work.															
Subsection:	716.04.20 Bore and Jack Conduit.															
Revision:	Replace the paragraph with the following: The Department will measure the quantity in linear feet. This item shall include all work necessary for boring and installing conduit under an existing roadway. Construction methods shall be in accordance with Sections 706.03.02, paragraphs 1, 2, and 4.															
Subsection:	716.05 PAYMENT.															
Revision:	Replace items 04810-04811, 20391NS835 and, 20392NS835 under <u>Code</u> , <u>Pay Item</u> , and <u>Pay Unit</u> with the following: <table><tr><td><u>Code</u></td><td><u>Pay Item</u></td><td><u>Pay Unit</u></td></tr><tr><td>04810</td><td>Electrical Junction Box</td><td>Each</td></tr><tr><td>04811</td><td>Electrical Junction Box Type B</td><td>Each</td></tr><tr><td>20391NS835</td><td>Electrical Junction Box Type A</td><td>Each</td></tr><tr><td>20392NS835</td><td>Electrical Junction Box Type C</td><td>Each</td></tr></table>	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>	04810	Electrical Junction Box	Each	04811	Electrical Junction Box Type B	Each	20391NS835	Electrical Junction Box Type A	Each	20392NS835	Electrical Junction Box Type C	Each
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20391NS835	Electrical Junction Box Type A	Each														
20392NS835	Electrical Junction Box Type C	Each														
Subsection:	723.02.02 Paint.															
Revision:	Replace sentence with the following: Conform to Section 821.															
Subsection:	723.03 CONSTRUCTION.															
Revision:	Replace bullet 5) with the following: 5) AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims,															
Subsection:	723.03.02 Poles and Bases Installation.															
Revision:	Replace the first sentence with the following: Regardless of the station and offset noted, locate all poles/bases behind the guardrail a minimum of four feet from the front face of the guardrail to the front face of the pole base.															
Subsection:	723.03.02 Poles and Bases Installation.															
Part:	A) Steel Strain and Mastarm Poles Installation															
Revision:	Replace the second paragraph with the following: For concrete base installation, see Section 716.03.02, B), 2), Paragraphs 2-7. Drilled shaft depth shall be based on the soil conditions encountered during drilling and slope condition at the site. Refer to the design chart below:															
Subsection:	723.03.02 Poles and Bases Installation.															
Part:	B) Pedestal or Pedestal Post Installation.															
Revision:	Replace the fourth sentence of the paragraph with the following: For breakaway supports, conform to Section 12 of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.															

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Subsection:	723.03.03 Trenching.
Part:	A) Under Roadway.
Revision:	Add the following after the second sentence: If depths greater than 24 inches are necessary, obtain the Engineer's approval and maintain either required conduit depths coming into the junction boxes. No payment for additional junction boxes for greater depths will be allowed.
Subsection:	723.03.11 Wiring Installation.
Revision:	Add the following sentence between the fifth and sixth sentences: Provide an extra two feet of loop wire and lead-in past the installed conduit in poles, pedestals, and junction boxes.
Subsection:	723.03.12 Loop Installation.
Revision:	Replace the fourth sentence of the 2nd paragraph with the following: Provide an extra two feet of loop wire and lead-in past the installed conduit in poles, pedestals, and junction boxes.
Subsection:	723.04.02 Junction Box.
Revision:	Replace subsection title with the following: Electrical Junction Box Type Various.
Subsection:	723.04.03 Trenching and Backfilling.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, backfilling, underground utility warning tape (if required), the restoration of disturbed areas to original condition, and will consider them incidental to this item of work.
Subsection:	723.04.10 Signal Pedestal.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, specified conduits, fittings, ground rod, ground wire, backfilling, restoring disturbed areas, or other necessary hardware and will consider them incidental to this item of work.
Subsection:	723.04.15 Loop Saw Slot and Fill.
Revision:	Replace the second sentence with the following: The Department will not measure sawing, cleaning and filling induction loop saw slot, loop sealant, backer rod, and grout and will consider them incidental to this item of work.
Subsection:	723.04.16 Pedestrian Detector.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit furnished, installed and connected to pole/pedestal. The Department will not measure installing R10-3e (with arrow) sign, furnishing and installing mounting hardware for sign and will consider them incidental to this item of work.
Subsection:	723.04.18 Signal Controller- Type 170.
Revision:	Replace the second sentence with the following: The Department will not measure constructing the concrete base or mounting the cabinet to the pole, connecting the signal and detectors, excavation, backfilling, restoration, any necessary pole mounting hardware, electric service, or electrical inspection fees and will consider them incidental to this item of work. The Department will also not measure furnishing and connecting the induction of loop amplifiers, pedestrian isolators, load switches, model 400 modem card; furnishing and installing electrical service conductors, specified conduits, anchors, meter base, fused cutout, fuses, ground rods, ground wires and will consider them incidental to this item of work.

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Subsection:	723.04.20 Install Signal Controller - Type 170.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit installed. The Department will not measure constructing the concrete base or mounting the cabinet to the pole, connecting the signal and detectors, and excavation, backfilling, restoration, any necessary pole mounting hardware, electric service, or electrical inspection fees and will consider them incidental to this item of work. The Department will also not measure connecting the induction loop amplifiers, pedestrian, isolators, load switches, model 400 modem card; furnishing and installing electrical service conductors, specified conduits, anchors, meter base, fused cutout, fuses, ground rods, ground wires and will consider them incidental to this item of work.
Subsection:	723.04.22 Remove Signal Equipment.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as a lump sum removal of signal equipment. The Department will not measure the return of control equipment and signal heads to the Department of Highways as directed by the District Traffic Engineer. The Department also will not measure the transportation of materials of the disposal of all other equipment and materials off the project by the contractor and will consider them incidental to this item of work.
Subsection:	723.04.28 Install Pedestrian Detector Audible.
Revision:	Replace the second sentence with the following: The Department will not measure installing sign R10-3e (with arrow) and will consider it incidental to this item of work.
Subsection:	723.04.29 Audible Pedestrian Detector.
Revision:	Replace the second sentence with the following: The Department will not measure furnishing and installing the sign R10-3e (with arrow) and will consider it incidental to this item of work.
Subsection:	723.04.30 Bore and Jack Conduit.
Revision:	Replace the paragraph with the following: The Department will measure the quantity in linear feet. This item shall include all work necessary for boring and installing conduit under an existing roadway. Construction methods shall be in accordance with Sections 706.03.02, paragraphs 1, 2, and 4.
Subsection:	723.04.31 Install Pedestrian Detector.
Revision:	Replace the paragraph with the following: The Department will measure the quantity as each individual unit installed and connected to pole/pedestal. The Department will not measure installing sign R 10-3e (with arrow) and will consider it incidental to this item of work.
Subsection:	723.04.32 Install Mast Arm Pole.
Revision:	Replace the second sentence with the following: The Department will not measure arms, signal mounting brackets, anchor bolts, or any other necessary hardware and will consider them incidental to this item of work.
Subsection:	723.04.33 Pedestal Post.
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, conduit, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.

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Subsection:	723.04.36 Traffic Signal Pole Base.															
Revision:	Replace the second sentence with the following: The Department will not measure excavation, reinforcing steel, anchor bolts, specified conduits, ground rods, ground wires, backfilling, or restoration and will consider them incidental to this item of work.															
Subsection:	723.04.37 Install Signal Pedestal.															
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, specified conduits, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.															
Subsection:	723.04.38 Install Pedestal Post.															
Revision:	Replace the second sentence with the following: The Department will not measure excavation, concrete, reinforcing steel, anchor bolts, specified conduits, fittings, ground rod, ground wire, backfilling, restoration, or any other necessary hardware and will consider them incidental to this item of work.															
Subsection:	723.05 PAYMENT.															
Revision:	<p>Replace items 04810-04811, 20391NS835 and, 20392NS835 under <u>Code</u>, <u>Pay Item</u>, and <u>Pay Unit</u> with the following:</p> <table><tr><td><u>Code</u></td><td><u>Pay Item</u></td><td><u>Pay Unit</u></td></tr><tr><td>04810</td><td>Electrical Junction Box</td><td>Each</td></tr><tr><td>04811</td><td>Electrical Junction Box Type B</td><td>Each</td></tr><tr><td>20391NS835</td><td>Electrical Junction Box Type A</td><td>Each</td></tr><tr><td>20392NS835</td><td>Electrical Junction Box Type C</td><td>Each</td></tr></table>	<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>	04810	Electrical Junction Box	Each	04811	Electrical Junction Box Type B	Each	20391NS835	Electrical Junction Box Type A	Each	20392NS835	Electrical Junction Box Type C	Each
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20391NS835	Electrical Junction Box Type A	Each														
20392NS835	Electrical Junction Box Type C	Each														
Subsection:	804.01.02 Crushed Sand.															
Revision:	Delete last sentence of the section.															
Subsection:	804.01.06 Slag.															
Revision:	<p>Add subsection and following sentence.</p> <p>Provide blast furnace slag sand where permitted. The Department will allow steel slag sand only in asphalt surface applications.</p>															
Subsection:	804.04 Asphalt Mixtures.															
Revision:	<p>Replace the subsection with the following:</p> <p>Provide natural, crushed, conglomerate, or blast furnace slag sand, with the addition of filler as necessary, to meet gradation requirements. The Department will allow any combination of natural, crushed, conglomerate or blast furnace slag sand when the combination is achieved using cold feeds at the plant. The Engineer may allow other fine aggregates.</p>															
Subsection:	806.03.01 General Requirements.															
Revision:	<p>Replace the second sentence of the paragraph with the following:</p> <p>Additionally, the material must have a minimum solubility of 99.0 percent when tested according to AASHTO T 44 and PG 76-22 must exhibit a minimum recovery of 60 percent, with a J_{NR} (nonrecoverable creep compliance) between 0.1 and 0.5, when tested according to AASHTO TP 70.</p>															

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Subsection:	806.03.01 General Requirements.						
Table:	PG Binder Requirements and Price Adjustment Schedule						
Revision:	Replace the Elastic Recovery, % ⁽³⁾ (AASHTO T301) and all corresponding values in the table with the following:						
	<u>Test</u>	<u>Specification</u>	<u>100% Pay</u>	<u>90% Pay</u>	<u>80% Pay</u>	<u>70% Pay</u>	<u>50% Pay⁽¹⁾</u>
	MSCR recovery, % ⁽³⁾ (AASHTO TP 70)	60 Min.	≥58	56	55	54	<53
Subsection:	806.03.01 General Requirements.						
Table:	PG Binder Requirements and Price Adjustment Schedule						
Superscript:	(3)						
Revision:	Replace ⁽³⁾ with the following: Perform testing at 64°C.						
Subsection:	813.04 Gray Iron Castings.						
Revision:	Replace the reference to "AASHTO M105" with "ASTM A48".						
Subsection:	813.09.02 High Strength Steel Bolts, Nuts, and Washers.						
Number:	A) Bolts.						
Revision:	Delete first paragraph and "Hardness Number" Table. Replace with the following: A) Bolts. Conform to ASTM A325 (AASHTO M164) or ASTM A490 (AASHTO 253) as applicable.						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Third paragraph, replace the reference to "AWPA C14" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Replace the first sentence of the fourth paragraph with the following: Use any of the species of wood for round or square posts covered under AWPA U1.						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Fourth paragraph, replace the reference to "AWPA C2" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	814.04.02 Timber Guardrail Posts.						
Revision:	Delete the second sentence of the fourth paragraph.						
Subsection:	814.05.02 Composite Plastic.						
Revision:	1) Add the following to the beginning of the first paragraph: Select composite offset blocks conforming to this section and assure blocks are from a manufacturer included on the Department's List of Approved Materials. 2) Delete the last paragraph of the subsection.						
Subsection:	816.07.02 Wood Posts and Braces.						
Revision:	First paragraph, replace the reference to "AWPA C5" with "AWPA U1, Section B, Paragraph 4.1".						
Subsection:	816.07.02 Wood Posts and Braces.						
Revision:	Delete the second sentence of the first paragraph.						
Subsection:	818.07 Preservative Treatment.						
Revision:	First paragraph, replace all references to "AWPA C14" with "AWPA U1, Section A".						

**Supplemental Specifications to the
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Subsection:	834.14 Lighting Poles.
Revision:	Replace the first sentence with the following: Lighting pole design shall be in accordance with loading and allowable stress requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims, with the exception of the following: The Cabinet will waive the requirement stated in the first sentence of Section 5.14.6.2 – Reinforced Holes and Cutouts for high mast poles (only). The minimum diameter at the base of the pole shall be 22 inches for high mast poles (only).
Subsection:	834.14.03 High Mast Poles.
Revision:	Remove the second and fourth sentence from the first paragraph.
Subsection:	834.14.03 High Mast Poles.
Revision:	Replace the third paragraph with the following: Provide calculations and drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky.
Subsection:	834.14.03 High Mast Poles.
Revision:	<p>Replace paragraph six with the following: Provide a pole section that conforms to ASTM A 595 grade A with a minimum yield strength of 55 KSI or ASTM A 572 with a minimum yield strength of 55 KSI. Use tubes that are round or 16 sided with a four inch corner radius, have a constant linear taper of .144 in/ft and contain only one longitudinal seam weld. Circumferential welded tube butt splices and laminated tubes are not permitted. Provide pole sections that are telescopically slip fit assembled in the field to facilitate inspection of interior surface welds and the protective coating. The minimum length of the telescopic slip splices shall be 1.5 times the inside diameter of the exposed end of the female section. Use longitudinal seam welds as commended in Section 5.15 of the AASHTO 2013 Specifications. The thickness of the transverse base shall not be less than 2 inches. Plates shall be integrally welded to the tubes with a telescopic welded joint or a full penetration groove weld with backup bar.</p> <p>The handhole cover shall be removable from the handhole frame. One the frame side opposite the hinge, provide a mechanism on the handhole cover/frame to place the Department's standard padlock as specified in Section 834.25. The handhole frame shall have two stainless studs installed opposite the hinge to secure the handhole cover to the frame which includes providing stainless steel wing nuts and washers. The handhole cover shall be manufactured from 0.25 inch thick galvanized steel (ASTM A 153) and have a neoprene rubber gasket that is permanently secured to the handhole frame to insure weather-tight protection. The hinge shall be manufactured from 7-guage stainless steel to provide adjustability to insure weather-tight fit for the cover. The minimum clear distance between the transverse plate and the bottom opening of the handhole shall not be less than the diameter of the bottom tube of the pole but needs to be at least 15 inches. Provide products that are hot-dip galvanized to the requirements of either ASTM A123 (fabricated products) or ASTM A 153 (hardware items).</p>
Subsection:	834.16 ANCHOR BOLTS.
Revision:	Insert the following sentence at the beginning of the paragraph: The anchor bolt design shall follow the NCHRP Report 494 Section 2.4 and NCHRP 469 Appendix A Specifications.

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Subsection:	834.17.01 Conventional.
Revision:	Add the following sentence after the second sentence: Provide a waterproof sticker mounted on the bottom of the housing that is legible from the ground and indicates the wattage of the fixture by providing the first two numbers of the wattage.
Subsection:	834.21.01 Waterproof Enclosures.
Revision:	Replace the last five sentences in the second paragraph with the following sentences: Provide a cabinet door with a louvered air vent, filter-retaining brackets and an easy to clean metal filter. Provide a cabinet door that is keyed with a factory installed standard no. 2 corbin traffic control key. Provide a light fixture with switch and bulb. Use a 120-volt fixture and utilize a L.E.D. bulb (equivalent to 60 watts minimum). Fixture shall be situated at or near the top of the cabinet and illuminate the contents of the cabinet. Provide a 120 VAC GFI duplex receptacle in the enclosure with a separate 20 amp breaker.
Subsection:	835.07 Traffic Poles.
Revision:	Replace the first sentence of the first paragraph with the following: Pole diameter and wall thickness shall be calculated in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.
Subsection:	835.07 Traffic Poles.
Revision:	*Replace the first sentence of the fourth paragraph with the following: Ensure transverse plates have a thickness ≥ 2 inches. *Add the following sentence to the end of the fourth paragraph: The bottom pole diameter shall not be less than 16.25 inches.
Subsection:	835.07 Traffic Poles.
Revision:	Replace the third sentence of the fifth paragraph with the following: For anchor bolt design, pole forces shall be positioned in such a manner to maximize the force on any individual anchor bolt regardless of the actual anchor bolt orientation with the pole.
Subsection:	835.07 Traffic Poles.
Revision:	Replace the first and second sentence of the sixth paragraph with the following: The pole handhole shall be 25 inches by 6.5 inches. The handhole cover shall be removable from the handhole frame. On the frame side opposite the hinge, provide a mechanism on the handhole cover/frame to place the Department's standard padlock as specified in Section 834.25. The handhole frame shall have two stainless studs installed opposite the hinge to secure the handhole cover to the frame which includes providing stainless steel wing nuts and washers. The handhole cover shall be manufactured from 0.25 inch thick galvanized steel (ASTM 153) and have a neoprene rubber gasket that is permanently secured to the handhole frame to insure weather-tight protection. The hinge shall be manufactured from 7 gauge stainless steel to provide adjustability to insure a weather-tight fit for the cover. The minimum clear distance between the transverse plate and the bottom opening of the handhole shall not be less than the diameter of the bottom tube but needs to be at least 12 inches.

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Subsection:	835.07 Traffic Poles.		
Revision:	*Replace the first sentence of the last paragraph with the following: Provide calculations and drawings that are stamped by a Professional Engineer licensed in the Commonwealth of Kentucky. *Replace the third sentence of the last paragraph with the following: All tables referenced in 835.07 are found in the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 2013-6th Edition with current interims.		
Subsection:	835.07.01 Steel Strain Poles.		
Revision:	Replace the second sentence of the second paragraph with the following: The detailed analysis shall be certified by a Professional Engineer licensed in the Commonwealth of Kentucky.		
Subsection:	835.07.01 Steel Strain Poles.		
Revision:	Replace number 7. after the second paragraph with the following: 7. Fatigue calculations should be shown for all fatigue related connections. Provide the corresponding detail, stress category and example from table 11.9.3.1-1.		
Subsection:	835.07.02 Mast Arm Poles.		
Revision:	Replace the second sentence of the fourth paragraph with the following: The detailed analysis shall be certified by a Professional Engineer licensed in the Commonwealth of Kentucky.		
Subsection:	835.07.02 Mast Arm Poles.		
Revision:	Replace number 7) after the fourth paragraph with the following: 7) Fatigue calculations should be shown for all fatigue related connections. Provide the corresponding detail, stress category and example from table 11.9.3.1-1.		
Subsection:	835.07.03 Anchor Bolts.		
Revision:	Add the following to the end of the paragraph: There shall be two steel templates (one can be used for the headed part of the anchor bolt when designed in this manner) provided per pole. Templates shall be contained within a 26.5 inch diameter. All templates shall be fully galvanized (ASTM A 153).		
Subsection:	835.16.05 Optical Units.		
Revision:	Replace the 3rd paragraph with the following: The list of certified products can be found on the following website: http://www.intertek.com .		
Subsection:	835.19.01 Pedestrian Detector Body.		
Revision:	Replace the first sentence with the following: Provide a four holed pole mounted aluminum rectangular housing that is compatible with the pedestrian detector.		
Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE I FABRIC GEOTEXTILES FOR SLOPE PROTECTION AND CHANNEL LINING		
Revision:	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	494	ASTM D6241
	Permittivity (1/s)	0.7	ASTM D4491

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Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE II FABRIC GEOTEXTILES FOR UNDERDRAINS		
Revision:	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	210	ASTM D6241
	Permittivity (1/s)	0.5	ASTM D4491
Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE III FABRIC GEOTEXTILES FOR SUBGRADE OR EMBANKMENT STABILIZATION		
Revision:	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	370	ASTM D6241
	Permittivity (1/s)	0.05	ASTM D4491
Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE IV FABRIC GEOTEXTILES FOR EMBANKMENT DRAINAGE BLANKETS AND PAVEMENT EDGE DRAINS		
Revision:	Add the following to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	309	ASTM D6241
	Permittivity (1/s)	0.5	ASTM D4491
Subsection:	843.01.01 Geotextile Fabric.		
Table:	TYPE V HIGH STRENGTH GEOTEXTILE FABRIC		
Revision:	Make the following changes to the chart:		
	<u>Property</u>	<u>Minimum Value⁽¹⁾</u>	<u>Test Method</u>
	CBR Puncture (lbs)	618	ASTM D6241
	Grab Strength (lbs)	700	ASTM D4632
	Apparent Opening Size	U.S. #40 ⁽³⁾	ASTM D4751
	⁽³⁾ Maximum average roll value.		

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SPECIAL NOTE FOR NON-EPOXY ADHESIVES

This Special Note will apply where indicated on the plans or in the proposal. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. As an alternate to Type IV epoxy, as specified in Subsection 826.01.02, the Department may allow other structural adhesives for doweling deformed reinforcing bars into hardened concrete providing the requirements herein are met.

2.0 MATERIALS. Furnish an adhesive material from the Department's List of Approved Materials. Submit one cartridge of each component per project to the Engineer for infrared analysis.

3.0 CONSTRUCTION. Do not use the material until the Engineer verifies, by visual inspection, that the material is from the List of Approved Materials.

3.1 Field Installation. Follow the following installation criteria:

- 1) Drill a dowel hole that is no more than 1/8 inch larger in diameter than the bar.
- 2) Ensure the dowel hole is dry and free of all drill and coring dust.
- 3) Place the adhesive in the dowel hole according to the manufacturer's instructions.
- 4) Insert the bar to the bottom of the hole and twist 1/4 turn. An excess amount of adhesive must be clearly visible as an extruded ring of material surrounding the reinforcing bar at the surface of the concrete.

3.2 Job Site Testing. Contact the Division of Materials in advance of the installation date to set up a testing schedule. After installation of the first 50 reinforcing bars, the Department will randomly select 5 and proof load according to the following table with zero slippage.

REBAR SIZE (#)	10	13	16	19	22
PROOF LOAD (lbs)	7,000	12,000	19,000	27,000	36,000

If any of the bars fail in bond, either revise the installation procedure, if applicable, or provide another adhesive that is capable of passing this test. The Engineer may require additional job site testing.

4.0 MEASUREMENT AND PAYMENT. The Department will not measure the adhesive or its application for payment and will consider it incidental to the reinforcing bars.

December 16, 2013

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SPECIAL NOTE FOR STRUCTURAL MASS CONCRETE

This Special Note will apply when indicated on the plans or in the proposal. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. This Special Note covers requirements for structural mass concrete placement. The Department considers mass concrete to be any concrete placement, excluding drilled shafts, with its least plan dimension being 6 feet or greater.

2.0 MATERIALS AND EQUIPMENT.

2.1 Cement. Conform to Section 801 or ASTM C595 for blended cements, Type IS or Type I(SM), except the slag constituent in Type IS is limited to 50 percent of the mass of the portland blast furnace slag.

2.2 Mineral Admixtures. Conform to Section 844 except the Department will permit fly ash Class F and Grade 100 ground granular blast furnace slag (GGBF) in addition to Grade 120.

2.3 Aggregate. Use coarse aggregate conforming to the freeze-thaw expansion requirements of Subsection 805.04.01 for use in all classes of structural mass concrete, excluding seal concrete.

2.4 Temperature Sensing Equipment. Use thermistor type temperature sensing devices, or an approved equal, capable of indicating temperatures over a range of 50 to 200 °F, with an accuracy of ± 1 °F and a precision of 1 °F. Connect the sensors to a device that continuously records and displays temperatures at intervals no greater than 4 hours, and produces a record that can be detached and filed.

3.0 CONSTRUCTION. When placing the mixture, do not allow its temperature to exceed 70 °F. Insulate the concrete until the thermal control is finished. Do not allow the concrete to exceed the maximum temperature of 160 °F at any time during the curing period.

3.1 Thermal Control Plan. Submit for approval a written Thermal Control Plan describing the procedures to be used to minimize temperature differentials within the concrete. Include all items required by this note, and other items deemed necessary or prudent.

Submit the Thermal Control Plan at least 30 calendar days before the first intended structural mass concrete placement. The Engineer will respond within 21 calendar days after receipt of the plan. Make any changes required by the Engineer and resubmit the plan. Continue this process until the Engineer approves the Thermal Control Plan.

Do not place structural mass concrete before receiving written approval of the Thermal Control Plan and having all equipment and materials necessary to facilitate the plan on the site and ready for use.

Approval of the Thermal Control Plan is independent of the submission of the trial mixtures.

The Department will allow the inclusion of the following items in the Thermal Control Plan.

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- 1) Reduction of the total cement content by the use of mineral admixtures. Mineral admixtures derived from blended cements, used as processing additions, or as ingredient materials will apply toward stated maximums.
 - a. Substitution of Class F fly ash for cement at the rate of 25 to 30 percent, by mass, applying a substitution rate of 1.0 to 1.25 pounds of fly ash added.
 - b. Substitution of GGBF for cement up to a maximum of 50 percent, by mass, applying a substitution rate of one pound of GGBF for each one pound of cement.
 - c. Mixes with both GGBF and Class F fly ash, permit up to but no more than 20 percent of the 50 percent GGBF maximum as Class F fly ash.
- 2) Sprinkle the mixer trucks' drums for cooling.
- 3) Arrange with supplier to avoid delivery of hot cement.
- 4) Cooling of aggregate stockpiles.
- 5) Use of a nitrogen gas cooling system to cool the concrete mass before placement.
- 6) Use of shaved, flaked, or chipped ice as part of the mixing water.
- 7) Embedment in the structural mass concrete of a cooling system, approved by the Engineer, consisting of non-corrosive piping and circulating fresh water. Filling of the pipe with concrete or grout after its usefulness has ended is required.
- 8) Placing concrete during the coolest part of the day, or during cooler weather.
- 9) Use of special cements or additives that will reduce heat of hydration without affecting strength or durability.

3.2 Thermal Control.

3.2.1 Temperature Differential Restrictions. Ensure that the temperature differential between the geometric center of each placement and the geometric surface does not exceed 35 °F at any time. Maintain thermal control of each placement until the temperature at the center is within 35 °F of the average outside air temperature. Determine the average outside air temperature by averaging the daily high and low temperatures over the preceding 7 calendar days.

3.2.2 Temperature Sensing and Recording. For each placement of structural mass concrete, install 4 temperature sensors, 2 at separate locations near the geometric center of each concrete placement and 2 at the approximate center of the exterior face that has the least sun exposure with the longest distance to the interior sensors. Place the exterior side sensors two inches below the exterior surface. The Department requires 2 sensors at each location in order to have a primary and secondary backup.

3.2.3 Failure to Comply. If the temperature differential within any structural mass concrete placement exceeds 35 °F, take immediate corrective action, suspend future placement of structural mass concrete, and submit a revised Thermal Control Plan to the Engineer for approval. Do not resume placing mass concrete without written approval from the Engineer.

3.3 Trial Mixtures. At least 30 calendar days prior to concrete placement, for each class of concrete used in structural mass concrete, make trial batches according to Subsection 601.03.02 G).

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3.4 Seal Concrete. Conform to all requirements herein this note for underwater placement of concrete seals, with the following exceptions.

- 1) The Department will not require thermistor devices.
- 2) The Department will not require insulation.
- 3) The Department will not require monitoring of the differential between interior and exterior temperatures.
- 4) When placing the mixture, do not allow its temperature to exceed 60° F.
- 5) Ensure seal concrete has the following properties:

Cementitious Content	564 lbs/cy
Maximum Free Water	0.47 lb water/lb cement
Slump	4-8 inches
Air Content	0-5%
28-day Compressive Strength	3,500 psi

3.5 Acceptance Testing. Conform to the specified 28-day compressive strength requirements for each class of concrete. The Department will make extra cylinders at the rate of one set per 100 cubic yards, except seal concrete shall be one set per 200 cubic yards, and will test them at an age of 7 days. The Department will cure the extra cylinders, after the first 24 hours, at a temperature between 60 °F and 80 °F. The extra cylinders will be expected to achieve a minimum 7-day compressive strength of 2,600 psi. If the 2,600 psi is not consistently achieved, take corrective action on future pours.

4.0 MEASUREMENT. The Department will not measure the work required by this Special Note as a separate pay unit and will consider it incidental to the various concrete bid items.

5.0 PAYMENT. When the temperature differential exceeds 35 °F during the thermal control period, the Department will adjust payment for the concrete within the affected placement by multiplying the contract unit price by the appropriate factor in the following table:

<u>Temperature Differential</u>	<u>Pay Factor</u>
36 to 40 °F	0.96
41 to 45 °F	0.90
46 °F or higher	0.80

When the 35 °F differential is exceeded for more than one 24-hour period, the Department will apply the pay factor for the maximum differential that occurs. Begin measuring temperature differential 12 hours after the last concrete placement.

June 15, 2012

SPECIAL NOTE FOR TURF REINFORCING MAT

1.0 DESCRIPTION. Install turf reinforcement mat at locations specified in the Contract or as the Engineer directs. Section references herein are to the Department's 2008 Standard Specifications for Road and Bridge Construction.

2.0 MATERIALS.

2.1 Turf Reinforcement Mat (TRM). Use a Turf Reinforcement Mat defined as permanent rolled erosion control product composed of non-degradable synthetic fibers, filaments, nets, wire mesh and/or other elements, processed into a three-dimensional matrix of sufficient thickness and from the Department's List of Approved Materials. Mats must be 100% UV stabilized materials. For TRMs containing degradable components, all physical property values must be obtained on the non-degradable portion of the matting exclusively. Ensure product labels clearly show the manufacturer or supplier name, style name, and roll number. Ensure labeling, shipment and storage follows ASTM D-4873. The Department will require manufacturer to provide TRMs that are machine constructed web of mechanically or melt bonded nondegradable fibers entangled to form a three dimensional matrix. The Department will require all long term performance property values in table below to be based on non degradable portion of the matting alone. Approved methods include polymer welding, thermal or polymer fusion, or placement of fibers between two high strength biaxially oriented nets mechanically bound by parallel stitching with polyolefin thread. Ensure that mats designated in the plans as Type 4 mats, are not to be manufactured from discontinuous or loosely held together by stitching or glued netting or composites. Type 4 mats shall be composed of geosynthetic matrix that exhibits a very high interlock and reinforcement capacities with both soil and root systems and with high tensile modulus. The Department will require manufacturer to use materials chemically and biologically inert to the natural soil environments conditions. Ensure the blanket is smolder resistant without the use of chemical additives. When stored, maintain the protective wrapping and elevate the mats off the ground to protect them from damage. The Department will not specify these materials for use in heavily acidic coal seam areas or other areas with soil problems that would severally limit vegetation growth.

- A) Dimensions. Ensure TRMs are furnished in strips with a minimum width of 4 feet and length of 50 feet.
- B) Weight. Ensure that all mat types have a minimum mass per unit area of 7 ounces per square yard according to ASTM D 6566.
- C) Performance Testing: The Department will require AASHTO's NTPEP index testing. The Department will also require the manufacturer to perform internal MARV testing at a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory for tensile strength, tensile elongation, mass per unit area, and thickness once every 24,000 yds of production or whatever rate is required to ensure 97.7% confidence under ASTM D4439& 4354. The Department will require Full scale testing for slope and channel applications shear stress shall be done under ASTM D 6459, ASTM D 6460-07 procedures.

2.2 Classifications

The basis for selection of the type of mat required will be based on the long term shear stress level of the mat of the channel in question or the degree of slope to protect and will be designated in the contract. The Type 4 mats are to be used at structural backfills protecting critical

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structures, utility cuts, areas where vehicles may be expected to traverse the mat, channels with large heavy drift, and where higher factors of safety, very steep slopes and/or durability concerns are needed as determined by project team and designer and will be specified in the plans by designer.

Turf Reinforcement Matting					
Properties ¹	Type 1	Type 2	Type 3	Type 4	Test Method
Minimum tensile Strength lbs/ft	125	150	175	3000 by 1500	ASTM D6818 ²
UV stability (minimum % tensile retention)	80	80	80	90	ASTM D4355 ³ (1000-hr exposure)
Minimum thickness (inches)	0.25	0.25	0.25	0.40	ASTM D6525
Slopes applications	2H:1V or flatter	1.5H:1V or flatter	1H:1V or flatter	1 H: 1V or greater	
Shear stress lbs/ft ² Channel applications	6.0 ⁴	8.0 ⁴	10.0 ⁴	12.0 ⁴	ASTM D6459 ASTM D6460-07

¹ For TRMs containing degradable components, all physical property values must be obtained on the non-degradable portion of the matting alone.

²Minimum Average Roll Values for tensile strength of sample material machine direction.

³Tensile Strength percentage retained after stated 1000 hr duration of exposure under ASTM D4355 testing. Based on nondegradable components exclusively.

⁴Maximum permissible shear design values based on short-term (0.5 hr) vegetated data obtained by full scale flume testing ASTM D6459, D6460-07. Based on nondegradable components exclusively. Testing will be done at Independent Hydraulics Facility such as Colorado State University hydraulics laboratory, Utah State University hydraulics laboratory, Texas Transportation Institute (TTI) hydraulics and erosion control laboratory.

2.3 Quality Assurance Sampling, Testing, and Acceptance

- A) Provide TRM listed on the Department's List of Approved Materials. Prior to inclusion on the LAM, the manufacturer of TRM must meet the physical and performance criteria as outlined in the specification and submit a Letter Certifying compliance of the product under the above ASTM testing procedures and including a copy of report from Full Scale Independent Hydraulics Facility that Fully Vegetated Shear Stress meets shear stress requirements tested under D6459 and D6460-07.
- B) Contractors will provide a Letter of Certification from Manufacturer stating the product name, manufacturer, and that the product MARV product unit testing results meets Department criteria. Provide Letters once per project and for each product.
- C) Acceptance shall be in accordance with ASTM D-4759 based on testing performed by a Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP) accredited laboratory using Procedure A of ASTM D-4354.

Current mats meeting the above criteria are shown on the Department’s List of Approved Materials.

2.4 Fasteners. When the mat manufacturer does not specify a specific fastener, use steel wire U-shaped staples with a minimum diameter of 0.09 inches (11 gauge), a minimum width of one inch and a minimum length of 12 inches. Use a heavier gauge when working in rocky or clay soils and longer lengths in sandy soils as directed by Engineer or Manufacturer’s Representative. Provide staples with colored tops when requested by the Engineer.

3.0 CONSTRUCTION. When requested by the Engineer, provide a Manufacturer’s Representative on-site to oversee and approve the initial installation of the mat. When requested by the Engineer, provide a letter from the Manufacturer approving the installation. When there is a conflict between the Department’s criteria and the Manufacturer’s criteria, construct using the more restrictive. The Engineer and Manufacturer’s Representative must approve all alternate installation methods prior to execution. Construct according to the Manufacturer’s recommendations and the following as minimum installation technique:

3.1 Site Preparation. Grade areas to be treated with matting and compact. Remove large rocks, soil clods, vegetation, roots, and other sharp objects that could keep the mat from intimate contact with subgrade. Prepare seedbed by loosening the top 2 to 3 inch of soil.

3.2 Installation. Install mats according to Standard Drawing Sepias “Turf Mat Channel Installation” and “Turf Mat Slope Installation.” Install mats at the specified elevation and alignment. Anchor the mats with staples with a minimum length of 12 inches. Use longer anchors for installations in sandy, loose, or wet soils as directed by the Engineer or Manufacturer’s Representative. The mat should be in direct contact with the soil surface.

4.0 MEASUREMENT. The Department will measure the quantity of Turf Reinforcement Mat by the square yard of surface covered. The Department will not measure preparation of the bed, providing a Manufacturer’s Representative, topsoil, or seeding for payment and will consider them incidental to the Turf Reinforcement Mat. The Department will not measure any reworking of slopes or channels for payment as it is considered corrective work and incidental to the Turf Reinforcement Mat. Seeding and protection will be an incidental item.

5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
23274EN11F	Turf Reinforcement Mat 1	Square Yard
23275EN11F	Turf Reinforcement Mat 2	Square Yard
23276EN11F	Turf Reinforcement Mat 3	Square Yard
23277EN11F	Turf Reinforcement Mat 4	Square Yard

April 18, 2009

SPECIAL PROVISION FOR EMBANKMENT AT BRIDGE END BENT STRUCTURES

This Special Provision will apply when indicated on the plans or in the proposal. Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

1.0 DESCRIPTION. Construct a soil, granular, or rock embankment with granular or cohesive pile core and place structure granular backfill, as the Plans require. Construct the embankment according to the requirements of this Special Provision, the Plans, Standard Drawing RGX 100 and 105, and the 2012 Standard Specifications.

2.0 MATERIALS.

2.1 Granular Embankment. Conform to Subsection 805.10. When Granular Embankment materials are erodible or unstable according to Subsection 805.03.04, use the Special Construction Methods found in 3.2 of the Special Provision.

2.2 Rock Embankment. Provide durable rock from roadway excavation that consists principally of Unweathered Limestone, Durable Shale (SDI equal to or greater than 95 according to KM 64-513), or Durable Sandstone.

2.3 Granular Pile Core. Select a gradation of durable rock to facilitate pile driving that conforms to Subsection 805.11. If granular pile core material hinders pile driving operations, take appropriate means necessary to reach the required pile tip elevation, at no expense to the Department.

2.4 Cohesive Pile Core. Conform to Section 206 of the Standard Specifications and use soil with at least 50 percent passing a No. 4 sieve having a minimum Plasticity Index (PI) of 10. In addition, keep the cohesive pile core free of boulders, larger than 6 inches in any dimension, or any other obstructions, which would interfere with drilling operations. If cohesive pile core material interferes with drilling operations, take appropriate means necessary to maintain excavation stability, at no expense to the Department.

2.5 Structure Granular Backfill. Conform to Subsection 805.11

2.6 Geotextile Fabric. Conform to Type I or Type IV in Section 214 and 843 as required in the plans.

3.0 CONSTRUCTION.

3.1 General. Construct roadway embankments at end bents according to Section 206 and in accordance with the Special Provision, the Plans, and Standard Drawings for the full embankment section. In some instances, granular or rock embankment will be required for embankment construction for stability purposes, but this special provision does not prevent the use of soil when appropriate. Refer to the plans for specific details regarding material requirements for embankment construction.

Place and compact granular or cohesive pile core, soil, granular or rock embankment, and structure granular backfill according to the applicable density requirements for the project. When constructing granular or rock embankments, use granular pile core for driven pile foundations and use cohesive pile core for pre-drilled pile or drilled shaft foundations. Place geotextile fabric, Type IV between cohesive pile core and structure

granular backfill and granular or rock embankment.

When granular or rock embankment is required for embankment construction, conform to the general requirements of Subsection 206.03.02 B). In addition, place the material in no greater than 2-foot lifts and compact with a vibrating smooth wheel roller capable of producing a minimum centrifugal force of 15 tons. Apply these requirements to the full width of the embankment for a distance of half the embankment height or 50 feet, whichever is greater, as shown on Standard Drawing RGX-105.

When using granular pile core, install 8-inch perforated underdrain pipe at or near the elevation of the original ground in the approximate locations depicted on the standard drawing, and as the Engineer directs, to ensure positive drainage of the embankment. Wrap the perforated pipe with a fabric of a type recommended by the pipe manufacturer.

After constructing the embankment, excavate for the end bent cap, drive piling or install shafts, place the mortar bed, construct the end bent, and complete the embankment to finish grade according to the construction sequence shown on the Plans or Standard Drawings and as specified hereinafter.

Certain projects may require widening of existing embankments and the removal of substructures. Construct embankment according to the plans. Substructure removal shall be completed according to the plans and Section 203. Excavation may be required at the existing embankment in order to place the structure granular backfill as shown in the Standard Drawings.

After piles are driven or shafts installed (see design drawings), slope the bottom of the excavation towards the ends of the trench as noted on the plans for drainage. Using a separate pour, place concrete mortar, or any class concrete, to provide a base for forming and placing the cap. Place side forms for the end bent after the mortar has set sufficiently to support workmen and forms without being disturbed.

Install 4-inch perforated pipe in accordance with the plans and Standard Drawings. In the event slope protection extends above the elevation of the perforated pipe, extend the pipe through the slope protection.

After placing the end bent cap and removing adjacent forms, fill the excavation with structure granular backfill material to the level of the berm prior to placing beams for the bridge. For soil embankments, place Type IV geotextile fabric between embankment material and structure granular backfill. After completing the end bent backwall, or after completing the span end wall, place the structure granular backfill to subgrade elevation. If the original excavation is enlarged, fill the entire volume with compacted structure granular backfill at no expense to the Department. Do not place backfill before removing adjacent form work. Place structure granular backfill material in trench ditches at the ends of the excavation. Place Geotextile Fabric, Type IV over the surface of structure granular backfill prior to placing aggregate base course.

Tamp the backfill with hand tampers, pneumatic tampers, or other means the Engineer approves. Thoroughly compact the backfill under the overhanging portions of the structure to ensure that the backfill is in intimate contact with the sides of the structure.

Do not apply seeding, sodding, or other vegetation to the exposed granular embankment.

3.2 Special Construction Methods. Erodible or unstable materials may erode even when protected by riprap or channel lining; use the special construction method described below when using these materials.

Use fine aggregates or friable sandstone granular embankment at "dry land" structures only. Do not use them at stream crossings or locations subject to flood waters.

For erodible or unstable materials having 50 percent or more passing the No. 4 sieve, protect with geotextile fabric. Extend the fabric from the original ground to the top of slope over the entire area of the embankment slopes on each side of, and in front of, the

end bent. Cover the fabric with at least 12 inches of non-erodible material.

For erodible or unstable materials having less than 50 percent passing a No. 4 sieve, cover with at least 12 inches of non-erodible material.

Where erodible or unstable granular embankment will be protected by riprap or channel lining, place geotextile fabric between the embankment and the specified slope protection.

4.0 MEASUREMENT.

4.1 Granular Embankment. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The Department will not measure for payment any Granular Embankment that is not called for in the plans.

The Department will not measure for payment any special construction caused by using erodible or unstable materials and will consider it incidental to the Granular Embankment regardless of whether the erodible or unstable material was specified or permitted.

4.2 Rock Embankment. The Department will not measure for payment any rock embankment and will consider it incidental to roadway excavation or embankment in place, as applicable. Rock embankments will be constructed using granular embankment on projects where there is no available rock present within the excavation limits of the project.

4.3 Granular Pile Core. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The Department will not measure for payment furnishing and placing 8-inch perforated underdrain pipe and will consider it incidental to the Granular pile core. The Department will not measure for payment any granular pile core that is necessary because the contractor elects to use granular or rock embankment when it is not specified in the plans.

4.4 Cohesive Pile Core. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204.

4.5 Structure Granular Backfill. The Department will measure the quantity in cubic yards using the plan quantity, increased or decreased by authorized adjustments as specified in Section 204. The Department will not measure any additional material required for backfill outside the limits shown on the Plans and Standard Drawings for payment and will consider it incidental to the work.

The Department will not measure structure excavation at the end bent or an existing embankment for payment and will consider it incidental to Structure Granular Backfill.

The Department will not measure for payment the 4-inch perforated underdrain pipe and will consider it incidental to the Structure Granular Backfill.

4.6 Geotextile Fabric. The Department will measure the quantities as specified in Section 214. The Department will not measure the quantity of fabric used for separating granular or rock embankment and cohesive pile core and will consider it incidental to cohesive pile core.

4.7 End Bent. The Department will measure the quantities according to the

Contract. The Department will not measure furnishing and placing the 2-inch mortar or concrete bed for payment and will consider it incidental to the end bent construction.

5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02223	Granular Embankment	Cubic Yards
20209EP69	Granular Pile Core	Cubic Yards
20210EP69	Cohesive Pile Core	Cubic Yards
02231	Structure Granular Backfill	Cubic Yards
02596, 02599	Geotextile Fabric, Type	See Section 214

The Department will consider payment as full compensation for all work required in this provision.

June 15, 2012

PART III

EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

FHWA-1273 -- Revised May 1, 2012

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

**KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS**

**EMPLOYMENT REQUIREMENTS
RELATING TO
NONDISCRIMINATION OF EMPLOYEES
(APPLICABLE TO FEDERAL-AID SYSTEM CONTRACTS)**

**AN ACT OF THE KENTUCKY GENERAL ASSEMBLY
TO PREVENT DISCRIMINATION IN EMPLOYMENT**

**KRS CHAPTER 344
EFFECTIVE JUNE 16, 1972**

The contract on this project, in accordance with KRS Chapter 344, provides that during the performance of this contract, the contractor agrees as follows:

1. The contractor shall not fail or refuse to hire, or shall not discharge any individual, or otherwise discriminate against an individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, national origin, sex, disability or age (between forty and seventy); or limit, segregate, or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, national origin, sex, disability or age (between forty and seventy). The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor shall not print or publish or cause to be printed or published a notice or advertisement relating to employment by such an employer or membership in or any classification or referral for employment by the employment agency, indicating any preference, limitation, specification, or discrimination, based on race, color, religion, national origin, sex, disability or age (between forty and seventy), except that such notice or advertisement may indicate a preference, limitation, or specification based on religion, or national origin when religion, or national origin is a bona fide occupational qualification for employment.

3. If the contractor is in control of apprenticeship or other training or retraining, including on-the-job training programs, he shall not discriminate against an individual because of his race, color, religion, national origin, sex, disability or age (between forty and seventy), in admission to, or employment in any program established to

provide apprenticeship or other training.

4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for non-compliance.

REVISED: 12-3-92

EXECUTIVE BRANCH CODE OF ETHICS

In the 1992 regular legislative session, the General Assembly passed and Governor Brereton Jones signed Senate Bill 63 (codified as KRS 11A), the Executive Branch Code of Ethics, which states, in part:

KRS 11A.040 (6) provides:

No present or former public servant shall, within six (6) months of following termination of his office or employment, accept employment, compensation or other economic benefit from any person or business that contracts or does business with the state in matters in which he was directly involved during his tenure. This provision shall not prohibit an individual from returning to the same business, firm, occupation, or profession in which he was involved prior to taking office or beginning his term of employment, provided that, for a period of six (6) months, he personally refrains from working on any matter in which he was directly involved in state government. This subsection shall not prohibit the performance of ministerial functions, including, but not limited to, filing tax returns, filing applications for permits or licenses, or filing incorporation papers.

KRS 11A.040 (8) states:

A former public servant shall not represent a person in a matter before a state agency in which the former public servant was directly involved, for a period of one (1) year after the latter of:

- a) The date of leaving office or termination of employment; or
- b) The date the term of office expires to which the public servant was elected.

This law is intended to promote public confidence in the integrity of state government and to declare as public policy the idea that state employees should view their work as a public trust and not as a way to obtain private benefits.

If you have worked for the executive branch of state government within the past six months, you may be subject to the law's prohibitions. The law's applicability may be different if you hold elected office or are contemplating representation of another before a state agency.

Also, if you are affiliated with a firm which does business with the state and which employs former state executive-branch employees, you should be aware that the law may apply to them.

In case of doubt, the law permits you to request an advisory opinion from the Executive Branch Ethics Commission, Room 136, Capitol Building, 700 Capitol Avenue, Frankfort, Kentucky 40601; telephone (502) 564-7954.

KENTUCKY TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS
TRAINING SPECIAL PROVISIONS

This Training Special Provision supersedes subparagraph 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities," (Attachment 1), and is in implementation of 23 U.S.C. 140(a).

As part of the contractor's equal employment opportunity affirmative action program training shall be provided as follows:

The contractor shall provide on-the-job training aimed at developing full journeymen in the type of trade or job classification involved.

The number of trainees to be trained under these special provisions and in this contract is shown in "Special Notes Applicable to Project" in the bid proposal.

In the event that a contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided, however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this training special provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing construction the contractor shall submit to the Kentucky Transportation Cabinet, Department of Highways for its approval, an acceptable training program on forms provided by the Cabinet indicating the number of trainees to be trained in each selected classification. Failure to provide the Cabinet with the proper documentation evidencing an acceptable training program prior to commencing construction shall cause the Cabinet to suspend the operations of the contractor with (if applicable) working days being charged as usual against the contract time or (if applicable), no additional contract time being granted for the suspension period. The Cabinet will not be liable for the payment of any work performed during the suspension period due to the failure of the contractor to provide an acceptable training program. Said suspension period shall be terminated when an acceptable training program is received by the Cabinet. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor's records should document the findings in each case. The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Kentucky Transportation Cabinet, Department of Highways and the Federal Highway Administration shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs

registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the contractor will be reimbursed for each hour of training given an employee on this contract in accordance with an approved training program. As approved by the engineer, reimbursement will be made for training persons in excess of the number specified herein. This reimbursement will be made even though the contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees be on board for the entire length of the contract. A contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The contractor shall furnish the trainee a copy of the program he will follow in providing the training. The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

General Decision Number: KY140102 11/07/2014 KY102

Superseded General Decision Number: KY20130102

State: Kentucky

Construction Type: Highway

Counties: Allen, Ballard, Butler, Caldwell, Calloway, Carlisle, Christian, Crittenden, Daviess, Edmonson, Fulton, Graves, Hancock, Henderson, Hickman, Hopkins, Livingston, Logan, Lyon, Marshall, McCracken, McLean, Muhlenberg, Ohio, Simpson, Todd, Trigg, Union, Warren and Webster Counties in Kentucky.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Modification Number	Publication Date
0	01/03/2014
1	04/04/2014
2	04/18/2014
3	05/16/2014
4	05/23/2014
5	06/06/2014
6	07/04/2014
7	07/18/2014
8	08/01/2014
9	10/24/2014
10	11/07/2014

BRIN0004-002 06/01/2014

BALLARD, BUTLER, CALDWELL, CARLISLE, CRITTENDEN, DAVIESS, EDMONSON, FULTON, GRAVES, HANCOCK, HENDERSON, HICKMAN, HOPKINS, LIVINGSTON, LYON, MARSHALL, MCCrackEN, MCLEAN, MUHLENBERG, OHIO, UNION, and WEBSTER COUNTIES

	Rates	Fringes
BRICKLAYER		
Ballard, Caldwell, Carlisle, Crittenden, Fulton, Graves, Hickman, Livingston, Lyon, Marshall, and McCracken Counties.....	\$ 29.52	13.37
Butler, Edmonson, Hopkins, Muhlenberg, and Ohio Counties.....	\$ 24.61	10.22
Daviess, Hancock, Henderson, McLean, Union, and Webster Counties.....	\$ 28.68	13.72

BRTN0004-005 06/01/2014		

ALLEN, CALLOWAY, CHRISTIAN, LOGAN, SIMPSON, TODD, TRIGG, and

WARREN COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 25.37	10.50

CARP0357-002 04/01/2014		

	Rates	Fringes
CARPENTER.....	\$ 27.50	14.92
Diver.....	\$ 41.63	14.92
PILEDRIVERMAN.....	\$ 27.75	14.92

ELEC0369-006 05/29/2013		

BUTLER, EDMONSON, LOGAN, TODD & WARREN COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 29.48	14.37

* ELEC0429-001 06/01/2014		

ALLEN & SIMPSON COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 24.44	10.15 + 5%

ELEC0816-002 06/01/2014		

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN,
FULTON (Except a 5 mile radius of City Hall in Fulton), GRAVES,
HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCracken & TRIGG COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 30.82	25.5%+5.85
Cable spicers receive \$.25 per hour additional.		

ELEC1701-003 06/01/2013		

DAVISS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, MUHLENBERG, OHIO,
UNION & WEBSTER COUNTIES:

	Rates	Fringes
ELECTRICIAN.....	\$ 30.03	13.72
Cable spicers receive \$.25 per hour additional.		

ELEC1925-002 06/01/2014		

FULTON COUNTY (Up to a 5 mile radius of City Hall in Fulton):

	Rates	Fringes
CABLE SPLICER.....	\$ 25.00	10.27

ELECTRICIAN.....	\$ 24.80	11.01
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ENGI0181-017 07/01/2014

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 28.85	14.15
GROUP 2.....	\$ 26.24	14.15
GROUP 3.....	\$ 26.65	14.15
GROUP 4.....	\$ 25.95	14.15

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - A-Frame Winch Truck; Auto Patrol; Backfiller; Batcher Plant; Bituminous Paver; Bituminous Transfer Machine; Boom Cat; Bulldozer; Mechanic; Cableway; Carry-All Scoop; Carry Deck Crane; Central Compressor Plant; Cherry Picker; Clamshell; Concrete Mixer (21 cu. ft. or Over); Concrete Paver; Truck-Mounted Concrete Pump; Core Drill; Crane; Crusher Plant; Derrick; Derrick Boat; Ditching & Trenching Machine; Dragline; Dredge Operator; Dredge Engineer; Elevating Grader & Loaders; Grade-All; Gurries; Heavy Equipment Robotics Operator/Mechanic; High Lift; Hoe-Type Machine; Hoist (Two or More Drums); Hoisting Engine (Two or More Drums); Horizontal Directional Drill Operator; Hydrocrane; Hyster; KeCal Loader; LeTourneau; Locomotive; Mechanic; Mechanically Operated Laser Screed; Mechanic Welder; Mucking Machine; Motor Scraper; Orangepeel Bucket; Overhead Crane; Piledriver; Power Blade; Pumpcrete; Push Dozer; Rock Spreader, attached to equipment; Rotary Drill; Roller (Bituminous); Rough Terrain Crane; Scarifier; Scoopmobile; Shovel; Side Boom; Subgrader; Tailboom; Telescoping Type Forklift; Tow or Push Boat; Tower Crane (French, German & other types); Tractor Shovel; Truck Crane; Tunnel Mining Machines, including Moles, Shields or similar types of Tunnel Mining Equipment

GROUP 2 - Air Compressor (Over 900 cu. ft. per min.); Bituminous Mixer; Boom Type Tamping Machine; Bull Float; Concrete Mixer (Under 21 cu. ft.); Dredge Engineer; Electric Vibrator; Compactor/Self-Propelled Compactor; Elevator (One Drum or Buck Hoist); Elevator (When used to Hoist Building Material); Finish Machine; Firemen & Hoist (One Drum); Flexplane; Forklift (Regardless of Lift Height); Form Grader; Joint Sealing Machine; Outboard Motor Boat; Power Sweeper (Riding Type); Roller (Rock); Ross Carrier; Skid Mounted or Trailer Mounted Concrete Pump; Skid Steer Machine with all Attachments; Switchman or Brakeman; Throttle Valve Person; Tractair & Road Widening Trencher; Tractor (50 H.P. or Over); Truck Crane Oiler; Tugger; Welding Machine; Well Points;& Whirley Oiler

GROUP 3 -All Off Road Material Handling Equipment, including Articulating Dump Trucks; Greaser on Grease Facilities servicing Heavy Equipment

GROUP 4 - Bituminous Distributor; Burlap & Curing Machine; Cement Gun; Concrete Saw; Conveyor; Deckhand Oiler; Grout Pump; Hydraulic Post Driver; Hydro Seeder; Mud Jack; Oiler; Paving Joint Machine; Power Form Handling Equipment; Pump; Roller (Earth); Steerman; Tamping Machine; Tractor (Under 50 H.P.); & Vibrator

CRANES - with booms 150 ft. & Over (Including JIB), and where the length of the boom in combination with the length of the piling equals or exceeds 150 ft. - \$1.00 above Group 1 rate

EMPLOYEES ASSIGNED TO WORK BELOW GROUND LEVEL ARE TO BE PAID 10% ABOVE BASIC WAGE RATE. THIS DOES NOT APPLY TO OPEN CUT WORK.

IRON0070-005 06/01/2014

BUTLER COUNTY (Eastern eighth, including the Townships of Decker, Lee & Tilford);
EDMONSON COUNTY (Northern three-fourths, including the Townships of Asphalt, Bee Spring, Brownsville, Grassland, Huff, Kyrock, Lindseyville, Mammoth Cave, Ollie, Prosperity, Rhoda, Sunfish & Sweden)

	Rates	Fringes
IRONWORKER		
Structural; Ornamental;		
Reinforcing; Precast		
Concrete Erectors.....	\$ 26.97	19.75

IRON0103-004 04/01/2013

DAVISS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, OHIO, UNION & WEBSTER COUNTIES
BUTLER COUNTY (Townships of Aberdeen, Bancock, Casey, Dexterville, Dunbar, Elfie, Gilstrap, Huntsville, Logansport, Monford, Morgantown, Provo, Rochester, South Hill & Welchs Creek);
CALDWELL COUNTY (Northeastern third, including the Township of Creswell);
CHRISTIAN COUNTY (Northern third, including the Townships of Apex, Crofton, Kelly, Mannington & Wynns);
CRITTENDEN COUNTY (Northeastern half, including the Townships of Grove, Mattoon, Repton, Shady Grove & Tribune);
MUHLENBERG COUNTY (Townships of Bavier, Beech Creek Junction, Benton, Brennen, Browder, Central City, Cleaton, Depoy, Drakesboro, Eunis, Graham, Hillside, Luzerne, Lynn City, Martwick, McNary, Millport, Moorman, Nelson, Paradise, Powderly, South Carrollton, Tarina & Weir)

	Rates	Fringes
Ironworkers:.....	\$ 27.82	16.555

IRON0492-003 05/01/2013

ALLEN, LOGAN, SIMPSON, TODD & WARREN COUNTIES
BUTLER COUNTY (Southern third, including the Townships of Boston, Berrys Lick, Dimple, Jetson, Quality, Sharer, Sugar Grove & Woodbury);
CHRISTIAN COUNTY (Eastern two-thirds, including the Townships of Bennettstown, Casky, Herndon, Hopkinsville, Howell, Masonville, Pembroke & Thompsonville);
EDMONSON COUNTY (Southern fourth, including the Townships of

Chalybeate & Rocky Hill));
MUHLENBERG COUNTY (Southern eighth, including the Townships of
Dunnior, Penrod & Rosewood)

	Rates	Fringes
Ironworkers:.....	\$ 23.84	10.96

IRON0782-006 05/01/2014		

BALLARD, CALLOWAY, CARLISLE, FULTON, GRAVES, HICKMAN,
LIVINGSTON, LYON, MARSHALL, MCCracken & TRIGG COUNTIES
CALDWELL COUNTY (Southwestern two-thirds, including the
Townships of Cedar Bluff, Cider, Claxton, Cobb, Crowtown,
Dulaney, Farmersville, Fredonia, McGowan, Otter Pond &
Princeton);
CHRISTIAN COUNTY (Western third, Excluding the Townships of
Apex, Crofton, Kelly, Mannington, Wynns, Bennettstown, Casky,
Herndon, Hopkinsville, Howell, Masonville, Pembroke &
Thompsonville);
CRITTENDEN COUNTY (Southwestern half, including the Townships
of Crayne, Dycusburg, Frances, Marion, Mexico, Midway,
Sheridan & Told)

	Rates	Fringes
Ironworkers:		
Projects with a total contract cost of \$20,000,000.00 or above.....	\$ 27.09	20.66
All Other Work.....	\$ 25.50	19.02

LABO0189-005 07/01/2014		

BALLARD, CALLOWAY, CARLISLE, FULTON, GRAVES, HICKMAN,
LIVINGSTON, LYON, MARSHALL & MCCracken COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 21.50	12.26
GROUP 2.....	\$ 21.75	12.26
GROUP 3.....	\$ 21.80	12.26
GROUP 4.....	\$ 22.40	12.26

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement
Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter
Tender; Cement Mason Tender; Cleaning of Machines;
Concrete; Demolition; Dredging; Environmental - Nuclear,
Radiation, Toxic & Hazardous Waste - Level D; Flagperson;
Grade Checker; Hand Digging & Hand Back Filling; Highway
Marker Placer; Landscaping, Mesh Handler & Placer; Puddler;
Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail
& Fence Installer; Signal Person; Sound Barrier Installer;
Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper;
Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer);

Brickmason Tender; Mortar Mixer Operator; Scaffold Builder;
Burner & Welder; Bushhammer; Chain Saw Operator; Concrete
Saw Operator; Deckhand Scow Man; Dry Cement Handler;
Environmental - Nuclear, Radiation, Toxic & Hazardous Waste
- Level C; Forklift Operator for Masonary; Form Setter;
Green Concrete Cutting; Hand Operated Grouter & Grinder
Machine Operator; Jackhammer; Pavement Breaker; Paving
Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven
Georgia Buggy & Wheel Barrow; Power Post Hole Digger;
Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind
Trencher; Sand Blaster; Concrete Chipper; Surface
Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite
Operator & Mixer; Grout Pump Operator; Blaster; Side Rail
Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free
Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher;
Environmental - Nuclear, Radiation, Toxic & Hazardous Waste
- Levels A & B; Miner & Driller (Free Air); Tunnel Blaster;
& Tunnel Mucker (Free Air); Directional & Horizontal
Boring; Air Track Drillers (All Types); Powdermen &
Blasters; Troxler & Concrete Tester if Laborer is Utilized

LABO0189-006 07/01/2014

ALLEN, BUTLER, CALDWELL, CHRISTIAN, DAVIESS, EDMONSON, HANCOCK,
HOPKINS, LOGAN, MCLEAN, MUHLENBERG, OHIO, SIMPSON, TODD, TRIGG
& WARREN COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 22.66	11.10
GROUP 2.....	\$ 22.91	11.10
GROUP 3.....	\$ 22.96	11.10
GROUP 4.....	\$ 23.56	11.10

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement
Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter
Tender; Cement Mason Tender; Cleaning of Machines;
Concrete; Demolition; Dredging; Environmental - Nuclear,
Radiation, Toxic & Hazardous Waste - Level D; Flagperson;
Grade Checker; Hand Digging & Hand Back Filling; Highway
Marker Placer; Landscaping, Mesh Handler & Placer; Puddler;
Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail
& Fence Installer; Signal Person; Sound Barrier Installer;
Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper;
Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer);
Brickmason Tender; Mortar Mixer Operator; Scaffold Builder;
Burner & Welder; Bushhammer; Chain Saw Operator; Concrete
Saw Operator; Deckhand Scow Man; Dry Cement Handler;
Environmental - Nuclear, Radiation, Toxic & Hazardous Waste
- Level C; Forklift Operator for Masonary; Form Setter;
Green Concrete Cutting; Hand Operated Grouter & Grinder
Machine Operator; Jackhammer; Pavement Breaker; Paving

Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Levels A & B; Miner & Driller (Free Air); Tunnel Blaster; & Tunnel Mucker (Free Air); Directional & Horizontal Boring; Air Track Drillers (All Types); Powdermen & Blasters; Troxler & Concrete Tester if Laborer is Utilized

LABO0561-001 07/01/2014

CRITTENDEN, HENDERSON, UNION & WEBSTER COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 21.36	12.65
GROUP 2.....	\$ 21.61	12.65
GROUP 3.....	\$ 21.66	12.65
GROUP 4.....	\$ 22.26	12.65

LABORER CLASSIFICATIONS

GROUP 1 - Aging & Curing of Concrete; Asbestos Abatement Worker; Asphalt Plant; Asphalt; Batch Truck Dump; Carpenter Tender; Cement Mason Tender; Cleaning of Machines; Concrete; Demolition; Dredging; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level D; Flagperson; Grade Checker; Hand Digging & Hand Back Filling; Highway Marker Placer; Landscaping, Mesh Handler & Placer; Puddler; Railroad; Rip-rap & Grouter; Right-of-Way; Sign, Guard Rail & Fence Installer; Signal Person; Sound Barrier Installer; Storm & Sanitary Sewer; Swamper; Truck Spotter & Dumper; Wrecking of Concrete Forms; General Cleanup

GROUP 2 - Batter Board Man (Sanitary & Storm Sewer); Brickmason Tender; Mortar Mixer Operator; Scaffold Builder; Burner & Welder; Bushhammer; Chain Saw Operator; Concrete Saw Operator; Deckhand Scow Man; Dry Cement Handler; Environmental - Nuclear, Radiation, Toxic & Hazardous Waste - Level C; Forklift Operator for Masonary; Form Setter; Green Concrete Cutting; Hand Operated Grouter & Grinder Machine Operator; Jackhammer; Pavement Breaker; Paving Joint Machine; Pipelayer; Plastic Pipe Fusion; Power Driven Georgia Buggy & Wheel Barrow; Power Post Hole Digger; Precast Manhole Setter; Walk-Behind Tamper; Walk-Behind Trencher; Sand Blaster; Concrete Chipper; Surface Grinder; Vibrator Operator; Wagon Driller

GROUP 3 - Asphalt Luteman & Raker; Gunnite Nozzleman; Gunnite Operator & Mixer; Grout Pump Operator; Blaster; Side Rail Setter; Rail Paved Ditches; Screw Operator; Tunnel (Free Air); Water Blaster

GROUP 4 - Caisson Worker (Free Air); Cement Finisher;
Environmental - Nuclear, Radiation, Toxic & Hazardous Waste
- Levels A & B; Miner & Driller (Free Air); Tunnel Blaster;
& Tunnel Mucker (Free Air); Directional & Horizontal
Boring; Air Track Drillers (All Types); Powdermen &
Blasters; Troxler & Concrete Tester if Laborer is Utilized

PAIN0032-002 05/01/2013

BALLARD COUNTY

	Rates	Fringes
Painters:		
Bridges.....	\$ 30.56	15.18
All Other Work.....	\$ 28.26	15.18
Spray, Blast, Steam, High & Hazardous (Including Lead Abatement) and All Epoxy - \$1.00 Premium		

PAIN0118-003 06/01/2014

EDMONSON COUNTY:

	Rates	Fringes
Painters:		
Brush & Roller.....	\$ 18.50	12.02
Spray, Sandblast, Power Tools, Waterblast & Steam Cleaning.....	\$ 19.00	12.02

PAIN0156-006 04/01/2014

DAVIESS, HANCOCK, HENDERSON, MCLEAN, OHIO, UNION & WEBSTER
COUNTIES

	Rates	Fringes
Painters:		
BRIDGES		
GROUP 1.....	\$ 27.20	12.51
GROUP 2.....	\$ 27.45	12.51
GROUP 3.....	\$ 28.20	12.51
GROUP 4.....	\$ 29.20	12.51
ALL OTHER WORK:		
GROUP 1.....	\$ 26.05	12.51
GROUP 2.....	\$ 26.30	12.51
GROUP 3.....	\$ 27.05	12.51
GROUP 4.....	\$ 28.05	12.51

PAINTER CLASSIFICATIONS

GROUP 1 - Brush & Roller

GROUP 2 - Plasterers

GROUP 3 - Spray; Sandblast; Power Tools; Waterblast;
Steamcleaning; Brush & Roller of Mastics, Creosotes, Kwinch

Koate & Coal Tar Epoxy

GROUP 4 - Spray of Mastics, Creosotes, Kwinch Koate & Coal
Tar Epoxy

PAIN0456-003 07/01/2011

ALLEN, BUTLER, LOGAN, MUHLENBERG, SIMPSON, TODD & WARREN
COUNTIES:

	Rates	Fringes
Painters:		
BRIDGES		
Brush & Roller.....	\$ 22.55	9.65
Spray; Sandblast; Power Tools; Waterblast & Steam Cleaning.....	\$ 23.55	9.65
ALL OTHER WORK		
Brush & Roller.....	\$ 17.55	9.65
Spray; Sandblast; Power Tools; Waterblast & Steam Cleaning.....	\$ 18.55	9.65

ALL OTHER WORK - HIGH TIME PAY
Over 35 feet (up to 100 feet) - \$1.00 above base wage
100 feet and over - \$2.00 above base wage

DURING SPRAY PAINTING AND SANDBLASTING OPERATIONS, POT
TENDERS SHALL RECEIVE THE SAME WAGE RATES AS THE SPRAY
PAINTER OR NOZZLE OPERATOR

PAIN0500-002 06/01/2014

CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON,
GRAVES, HICKMAN, HOPKINS, LIVINGSTON, LYON, MARSHALL, MCCracken
& TRIGG COUNTIES:

	Rates	Fringes
Painters:		
Bridges.....	\$ 26.45	12.05
All Other Work.....	\$ 20.20	12.05

Waterblasting units with 3500 PSI and above - \$.50 premium
Spraypainting and all abrasive blasting - \$1.00 premium
Work 40 ft. and above ground level - \$1.00 premium

PLUM0184-002 07/01/2013

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN,
FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCracken
and TRIGG COUNTIES

	Rates	Fringes
Plumber; Steamfitter.....	\$ 33.11	14.83

PLUM0502-004 08/01/2013

ALLEN, BUTLER, EDMONSON, SIMPSON & WARREN

	Rates	Fringes
Plumber; Steamfitter.....	\$ 32.00	17.17

PLUM0633-002 08/01/2013

DAVISS, HANCOCK, HENDERSON, HOPKINS, LOGAN, MCLEAN,
MUHLENBERG, OHIO, TODD, UNION & WEBSTER COUNTIES:

	Rates	Fringes
PLUMBER/PIPEFITTER.....	\$ 29.87	14.25

TEAM0089-003 03/30/2014

ALLEN, BUTLER, EDMONSON, LOGAN, SIMPSON & WARREN COUNTIES

	Rates	Fringes
Truck drivers:		
Zone 1:		
Group 1.....	\$ 19.58	17.83
Group 2.....	\$ 19.76	17.83
Group 3.....	\$ 19.84	17.83
Group 4.....	\$ 19.86	17.83

GROUP 1 - Greaser; Tire Changer

GROUP 2 - Truck Mechanic; Single Axle Dump; Flat Bed; All
Terrain Vehicles when used to haul materials; Semi Trailer
or Pole Trailer when used to pull building materials and
equipment; Tandem Axle Dump; Driver of Distributors

GROUP 3 - Mixer All Types

GROUP 4 - Winch and A-Frame when used in transporting
materials; Ross Carrier; Fork Lift when used to transport
building materials; Driver on Pavement Breaker; Euclid and
Other Heavy Earth Moving Equipment; Low Boy; Articulator
Cat; Five Axle Vehicle

TEAM0215-003 03/31/2013

DAVISS, HANCOCK, HENDERSON, HOPKINS, MCLEAN, MUHLENBERG, OHIO
& WEBSTER COUNTIES

	Rates	Fringes
TRUCK DRIVER		
Group 1.....	\$ 20.93	16.85
Group 2.....	\$ 21.16	16.85
Group 3.....	\$ 21.23	16.85
Group 4.....	\$ 21.24	16.85

GROUP 1: Greaser, Tire Changer

GROUP 2: Truck Mechanic

GROUP 3: Single Axle Dump; Flat Bed; All Terrain Vehicle when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Driver of Distributors; Mixer All Types

GROUP 4: Euclid and other heavy earth moving equipment; Low Boy; Articulator Cat; 5 Axle Vehicle; Winch and A- Frame when used in transporting materials; Ross Carrier; Fork Lift when used to transport building materials; Driver on Pavement Breaker

TEAM0236-001 03/31/2013

BALLARD, CALDWELL, CALLOWAY, CARLISLE, CHRISTIAN, CRITTENDEN, FULTON, GRAVES, HICKMAN, LIVINGSTON, LYON, MARSHALL, MCCracken,TODD & TRIGG COUNTIES

	Rates	Fringes
TRUCK DRIVER		
Group 1.....	\$ 19.38	16.85
Group 2.....	\$ 19.56	16.85
Group 3.....	\$ 19.56	16.85
Group 4.....	\$ 19.66	16.85
Group 5.....	\$ 19.64	16.85

GROUP 1: Greaser, Tire Changer

GROUP 2: Truck Mechanic

GROUP 3: Single Axle Dump; Flat Bed; All Terrain Vehicle when used to haul materials; Semi Trailer or Pole Trailer when used to pull building materials and equipment; Tandem Axle Dump; Drivers of Distributors

GROUP 4: Euclid and other heavy earth moving equipment; Low Boy; Articulator Cat; Five Axle Vehicle; Winch and A-Frame when used in transporting materials; Ross Carrier

GROUP 5: Mixer All Types

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.
=====

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

Fringe benefit amounts are applicable for all hours worked except when otherwise noted.

These rates are listed pursuant to the Kentucky Determination No. CR-14-I-HWY dated July 14, 2014.

No laborer, workman or mechanic shall be paid at a rate less than that of a Journeyman except those classified as bona fide apprentices.

Apprentices or trainees shall be permitted to work as such subject to Administrative Regulations adopted by the Commissioner of Workplace Standards. Copies of these regulations will be furnished upon request from any interested person.

Before using apprentices on the job the contractor shall present to the Contracting Officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U. S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U. S. Bureau of Apprenticeship and Training.

The contractor shall submit to the Contracting Officer, written evidence of the established apprenticeship-journeyman ratios and wage rates in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

TO: EMPLOYERS/EMPLOYEES

PREVAILING WAGE SCHEDULE:

The wages indicated on this wage schedule are the least permitted to be paid for the occupations indicated. When an employee works in more than one classification, the employer must record the number of hours worked in each classification at the prescribed hourly base rate.

OVERTIME:

Overtime is to be paid after an employee works eight (8) hours a day or forty (40) hours a week, whichever gives the employee the greater wages. At least time and one-half the base rate is required for all overtime. A laborer, workman or mechanic and an employer may enter into a written agreement or a collective bargaining agreement to work more than eight (8) hours a calendar day but not more than ten (10) hours a calendar day for the straight time hourly rate. Wage violations or questions should be directed to the designated Engineer or the undersigned.

Diana Castle Radcliffe, P.E.
Director, Division of Construction Procurement
Frankfort, Kentucky 40622

General Decision Number: KY140157 08/29/2014 KY157

State: Kentucky

Construction Type: Heavy

County: Trigg County in Kentucky.

HEAVY CONSTRUCTION PROJECTS (including sewer/water construction).

Modification Number Publication Date
0 08/29/2014

CARP0064-007 04/01/2014

	Rates	Fringes
CARPENTER (Form Work Only).....	\$ 27.50	14.96

ELEC1701-001 06/01/2013

	Rates	Fringes
ELECTRICIAN.....	\$ 30.03	13.72

ENGI0181-046 07/01/2014

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 28.85	14.15
GROUP 2.....	\$ 26.24	14.15
GROUP 4.....	\$ 25.95	14.15

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - Crane; Drill; Loader; Mechanic; Pumpcrete

GROUP 2 - Bobcat/Skid Steer/Skid Loader; Concrete Pump

GROUP 4 - Pump

Operators on cranes with booms 150 feet and over (including jib) shall receive \$1.00 above Group 1 rate; 250 feet and over including jib shall receive \$1.50 above Class 1 rate. Combination Rate: All crane operators operating cranes, where the length of the boom in combination with the length of the piling leads equal or exceeds 150 feet, shall receive \$1.00 above the Group 1 rate.

Employees assigned to work below ground level are to be paid 10% above basic wage rate. This does not apply to open cut work.

IRON0070-001 06/01/2014

	Rates	Fringes
IRONWORKER (ORNAMENTAL AND REINFORCING)	\$ 26.97	19.75

LABO0265-015 05/01/2014		

	Rates	Fringes
LABORER Flagger.....	\$ 27.72	9.80

LABO0561-012 07/01/2014		

	Rates	Fringes
LABORER Concrete Finishing.....	\$ 22.26	12.65

LABO1214-007 07/01/2014		

	Rates	Fringes
LABORER Pipelayer.....	\$ 21.75	12.26

LABO1392-001 07/01/2014		

	Rates	Fringes
LABORER Concrete Saw (Hand Held/Walk Behind).....	\$ 22.91	11.10
Concrete Worker.....	\$ 22.66	11.10

UAVG-KY-0005 06/25/2014		

	Rates	Fringes
OPERATOR: Forklift.....	\$ 27.34	14.15

SUKY2011-034 06/25/2014		

	Rates	Fringes
IRONWORKER, STRUCTURAL.....	\$ 25.46	17.49
LABORER: Common or General.....	\$ 20.62	11.32
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 23.76	13.00
OPERATOR: Bulldozer.....	\$ 23.14	15.51
OPERATOR: Oiler.....	\$ 24.34	13.00
OPERATOR: Roller.....	\$ 20.21	13.00
OPERATOR: Trencher.....	\$ 26.34	12.58

TRUCK DRIVER: Dump Truck.....\$ 16.69 6.20

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Washington, DC 20210

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The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

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Administrative Review Board
U.S. Department of Labor

200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION

**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY
(Executive Order 11246)**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

GOALS FOR MINORITY PARTICIPATION IN EACH TRADE	GOALS FOR FEMALE PARTICIPATION IN EACH TRADE
12.0%	6.9%

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally-assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4, 3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within ten (10) working days of award of any construction subcontract in excess of \$10,000.00 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed. The notification shall be mailed to:

**Evelyn Teague, Regional Director
Office of Federal Contract Compliance Programs
61 Forsyth Street, SW, Suite 7B75
Atlanta, Georgia 30303-8609**

4. As used in this Notice, and in the contract resulting from this solicitation, the "**covered area**" is Trigg County.

PART IV

INSURANCE

INSURANCE

The Contractor shall procure and maintain the following insurance in addition to the insurance required by law:

- 1) Commercial General Liability-Occurrence form – not less than \$2,000,000 General aggregate, \$2,000,000 Products & Completed Aggregate, \$1,000,000 Personal & Advertising, \$1,000,000 each occurrence.
- 2) Automobile Liability- \$1,000,000 per accident
- 3) Employers Liability:
 - a) \$100,000 Each Accident Bodily Injury
 - b) \$500,000 Policy limit Bodily Injury by Disease
 - c) \$100,000 Each Employee Bodily Injury by Disease
- 4) The insurance required above must be evidenced by a Certificate of Insurance and this Certificate of Insurance must contain one of the following statements:
 - a) "policy contains no deductible clauses."
 - b) "policy contains _____ (amount) deductible property damage clause but company will pay claim and collect the deductible from the insured."
- 5) KENTUCKY WORKMEN'S COMPENSATION INSURANCE. The contractor shall furnish evidence of coverage of all his employees or give evidence of self-insurance by submitting a copy of a certificate issued by the Workmen's Compensation Board.

The cost of insurance is incidental to all contract items. All subcontractors must meet the same minimum insurance requirements.

PART V

BID ITEMS

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00001		DGA BASE	15,936.00	TON		\$	
0020	00018		DRAINAGE BLANKET-TYPE II-ASPH	1,780.00	TON		\$	
0030	00100		ASPHALT SEAL AGGREGATE	29.00	TON		\$	
0040	00103		ASPHALT SEAL COAT	3.48	TON		\$	
0050	00190		LEVELING & WEDGING PG64-22	252.00	TON		\$	
0060	00212		CL2 ASPH BASE 1.00D PG64-22	557.00	TON		\$	
0070	00214		CL3 ASPH BASE 1.00D PG64-22	8,946.00	TON		\$	
0080	00309		CL2 ASPH SURF 0.50D PG64-22	946.00	TON		\$	
0090	00324		CL3 ASPH SURF 0.50B PG64-22	1,732.00	TON		\$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0100	00071		CRUSHED AGGREGATE SIZE NO 57	989.00	TON		\$	
0110	00078		CRUSHED AGGREGATE SIZE NO 2	9.00	TON		\$	
0120	01000		PERFORATED PIPE-4 IN	2,367.00	LF		\$	
0130	01010		NON-PERFORATED PIPE-4 IN	200.00	LF		\$	
0140	01015		INSPECT & CERTIFY EDGE DRAIN SYSTEM	1.00	LS		\$	
0150	01024		PERF PIPE HEADWALL TY 2-4 IN	9.00	EACH		\$	
0160	01891		ISLAND HEADER CURB TYPE 2	50.00	LF		\$	
0170	01982		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE	36.00	EACH		\$	
0180	01984		DELINEATOR FOR BARRIER - WHITE	88.00	EACH		\$	
0190	01985		DELINEATOR FOR BARRIER - YELLOW	102.00	EACH		\$	
0200	01987		DELINEATOR FOR GUARDRAIL BI DIRECTIONAL WHITE	24.00	EACH		\$	
0210	02155		PAVED DITCH TYPE 1 MOD	98.00	SQYD		\$	
0220	02159		TEMP DITCH	2,781.00	LF		\$	
0230	02160		CLEAN TEMP DITCH	5,562.00	LF		\$	
0240	02200		ROADWAY EXCAVATION	123,441.00	CUYD		\$	
0250	02204		SPECIAL EXCAVATION	2,989.00	CUYD		\$	
0260	02223		GRANULAR EMBANKMENT	9,407.00	CUYD		\$	
0270	02230		EMBANKMENT IN PLACE	15,691.00	CUYD		\$	
0280	02242		WATER (FOR DUST CONTROL)	259.00	MGAL		\$	
0290	02262		FENCE-WOVEN WIRE TYPE 1	2,313.00	LF		\$	
0300	02351		GUARDRAIL-STEEL W BEAM-S FACE	804.00	LF		\$	
0310	02352		GUARDRAIL-STEEL W BEAM-D FACE	100.00	LF		\$	
0320	02359		GUARDRAIL CONNECTOR TO CONC MED BARR (MODIFIED)	1.00	EACH		\$	
0330	02360		GUARDRAIL TERMINAL SECTION NO 1	6.00	EACH		\$	
0340	02363		GUARDRAIL CONNECTOR TO BRIDGE END TY A (MODIFIED)	1.00	EACH		\$	
0350	02367		GUARDRAIL END TREATMENT TYPE 1	1.00	EACH		\$	
0360	02369		GUARDRAIL END TREATMENT TYPE 2A	1.00	EACH		\$	
0370	02381		REMOVE GUARDRAIL	3,008.00	LF		\$	

Report Date 11/18/14

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0380	02429		RIGHT-OF-WAY MONUMENT TYPE 1	18.00	EACH		\$	
0390	02430		RIGHT-OF-WAY MONUMENT TYPE 1A	3.00	EACH		\$	
0400	02482		CHANNEL LINING CLASS IA	30.00	TON		\$	
0410	02483		CHANNEL LINING CLASS II	39.00	TON		\$	
0420	02484		CHANNEL LINING CLASS III	167.00	TON		\$	
0430	02545		CLEARING AND GRUBBING (APPROXIMATELY 17.6 ACRES)	1.00	LS		\$	
0440	02562		TEMPORARY SIGNS FOR MAINTENANCE OF TRAFFIC	790.00	SQFT		\$	
0450	02570		PROJECT CPM SCHEDULE SEE DESIGN FOR SPECIAL NOTE	1.00	LS		\$	
0460	02585		EDGE KEY	103.00	LF		\$	
0470	02596		FABRIC-GEOTEXTILE TYPE I	10,281.00	SQYD		\$	
0480	02598		FABRIC-GEOTEXTILE TYPE III	4,691.00	SQYD		\$	
0490	02599		FABRIC-GEOTEXTILE TYPE IV	5,321.00	SQYD		\$	
0500	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0510	02673		PRECAST VEHICLE STOP	80.00	LF		\$	
0520	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		\$	
0530	02677		ASPHALT PAVE MILLING & TEXTURING	126.00	TON		\$	
0540	02678		SCARIFYING PAVEMENT	1,293.00	SQYD		\$	
0550	02692		SETTLEMENT PLATFORM	2.00	EACH		\$	
0560	02701		TEMP SILT FENCE	5,562.00	LF		\$	
0570	02703		SILT TRAP TYPE A	23.00	EACH		\$	
0580	02704		SILT TRAP TYPE B	23.00	EACH		\$	
0590	02705		SILT TRAP TYPE C	23.00	EACH		\$	
0600	02706		CLEAN SILT TRAP TYPE A	69.00	EACH		\$	
0610	02707		CLEAN SILT TRAP TYPE B	69.00	EACH		\$	
0620	02708		CLEAN SILT TRAP TYPE C	69.00	EACH		\$	
0630	02709		CLEAN TEMP SILT FENCE	11,124.00	LF		\$	
0640	02726		STAKING	1.00	LS		\$	
0650	02731		REMOVE STRUCTURE	1.00	LS		\$	
0660	05950		EROSION CONTROL BLANKET	7,119.00	SQYD		\$	
0670	05952		TEMP MULCH	110,296.00	SQYD		\$	
0680	05953		TEMP SEEDING AND PROTECTION	110,296.00	SQYD		\$	
0690	05963		INITIAL FERTILIZER	2.60	TON		\$	
0700	05964		20-10-10 FERTILIZER	4.30	TON		\$	
0710	05985		SEEDING AND PROTECTION	82,486.00	SQYD		\$	
0720	05990		SODDING	37.00	SQYD		\$	
0730	05992		AGRICULTURAL LIMESTONE	51.10	TON		\$	
0740	06510		PAVE STRIPING-TEMP PAINT-4 IN	17,117.00	LF		\$	
0750	06514		PAVE STRIPING-PERM PAINT-4 IN	29,133.00	LF		\$	
0760	06566		PAVE MARKING-THERMO X-WALK-12 IN	56.00	LF		\$	
0770	06567		PAVE MARKING-THERMO STOP BAR-12IN	107.00	LF		\$	
0780	06570		PAVE MARKING-PAINT CROSS-HATCH	5,633.00	SQFT		\$	
0790	06571		PAVE MARKING-PAINT PARKING LOT	321.00	LF		\$	
0800	06574		PAVE MARKING-THERMO CURV ARROW	8.00	EACH		\$	
0810	06575		PAVE MARKING-THERMO COMB ARROW	2.00	EACH		\$	
0820	06578		PAVE MARKING-THERMO MERGE ARROW	4.00	EACH		\$	
0830	06585		PAVEMENT MARKER TY IVA-MW TEMP	3.00	EACH		\$	
0840	06588		PAVEMENT MARKER TY IVA-BY TEMP	42.00	EACH		\$	
0850	06589		PAVEMENT MARKER TYPE V-MW	25.00	EACH		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0860	06591		PAVEMENT MARKER TYPE V-BY	20.00	EACH		\$	
0870	06592		PAVEMENT MARKER TYPE V-B W/R	30.00	EACH		\$	
0880	06593		PAVEMENT MARKER TYPE V-B Y/R	27.00	EACH		\$	
0890	08019		CYCLOPEAN STONE RIP RAP	11,669.00	TON		\$	
0900	08100		CONCRETE-CLASS A	3.38	CUYD		\$	
0910	08150		STEEL REINFORCEMENT	163.00	LB		\$	
0920	10020NS		FUEL ADJUSTMENT	94,739.00	DOLL	\$1.00	\$	\$94,739.00
0930	10030NS		ASPHALT ADJUSTMENT	47,603.00	DOLL	\$1.00	\$	\$47,603.00
0940	20060ES719		GUARDRAIL STEEL W BEAM-S FACE CR	684.00	LF		\$	
0950	20062ES719		GUARDRAIL TERMINAL SECT NO.1 CR	2.00	EACH		\$	
0960	20206EC		PAVE MARK HANDICAP SYMBOL	1.00	EACH		\$	
0970	20209EP69		GRANULAR PILE CORE	1,583.00	CUYD		\$	
0980	20782NS714		PAVE MARKING THERMO-BIKE	1.00	EACH		\$	
0990	21325ND		CONSTRUCTION TRAILER	1.00	LS		\$	
1000	22692NS714		PAVEMENT MARKING-THERMO LETTERS	18.00	EACH		\$	
1010	23086EN		CONCRETE MEDIAN BARRIER TY 9C (MODIFIED)	484.00	LF		\$	
1020	23143EN		DECORATIVE HANDRAIL (STEEL POWDER COATED FINISH)	2,383.00	LF		\$	
1030	23162EN		GUARDRAIL CONN TO BR END TY A-1 CR (MODIFIED)	1.00	EACH		\$	
1040	23274EN11F		TURF REINFORCEMENT MAT 1	4,124.00	SQYD		\$	
1050	23912EC		WEB CAMERA CONST MONITORING SYSTEM	1.00	LS		\$	
1060	23979EC		CRASH CUSHION TY VI CLASS C TL3	1.00	EACH		\$	
1070	24553ED		TELLTALE SURVEYING	20.00	EACH		\$	
1080	24620EC		HELPER BOAT	1.00	LS		\$	
1090	24626EC		PROJECT INSPECTION BOAT	1.00	LS		\$	
1100	24637EC		GUARDRAIL STEEL W BEAM-D FACE CR	1,409.00	LF		\$	
1110	24744ED		GUARDRAIL CONN TO CONC MED BARR MOD-CR	1.00	EACH		\$	
1120	24755EC		MAINTAIN EXISTING BRIDGE	1,000,000.00	DOLL	\$1.00	\$	\$1,000,000.00
1130	30000		REMOVABLE BOLLARD	4.00	EACH		\$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1140	00440		ENTRANCE PIPE-15 IN	106.00	LF		\$	
1150	00441		ENTRANCE PIPE-18 IN	122.00	LF		\$	
1160	00443		ENTRANCE PIPE-24 IN	61.00	LF		\$	
1170	01204		PIPE CULVERT HEADWALL-18 IN	2.00	EACH		\$	
1180	01371		METAL END SECTION TY 1-18 IN	2.00	EACH		\$	
1190	01373		METAL END SECTION TY 1-24 IN	1.00	EACH		\$	
1200	01434		SLOPED BOX OUTLET TYPE 1-24 IN	2.00	EACH		\$	
1210	01580		DROP BOX INLET TYPE 15	1.00	EACH		\$	
1220	01643		JUNCTION BOX-24 IN	1.00	EACH		\$	

Section: 0004 - BRIDGE - WEST APPROACH

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1230	02231		STRUCTURE GRANULAR BACKFILL	902.00	CUYD		\$	
1240	02599		FABRIC-GEOTEXTILE TYPE IV	508.00	SQYD		\$	
1250	02998		MASONRY COATING	9,324.00	SQYD		\$	
1260	03299		ARMORED EDGE FOR CONCRETE	76.00	LF		\$	
1270	08001		STRUCTURE EXCAVATION-COMMON	1,254.00	CUYD		\$	
1280	08033		TEST PILES	402.00	LF		\$	
1290	08051		PILES-STEEL HP14X89	8,680.00	LF		\$	
1300	08095		PILE POINTS-14 IN	90.00	EACH		\$	
1310	08100		CONCRETE-CLASS A (MASS CONCRETE: 1,239 CY)	3,247.00	CUYD		\$	
1320	08104		CONCRETE-CLASS AA	4,870.00	CUYD		\$	
1330	08150		STEEL REINFORCEMENT	810,824.00	LB		\$	
1340	08151		STEEL REINFORCEMENT-EPOXY COATED	1,726,737.00	LB		\$	
1350	08160		STRUCTURAL STEEL (APPROACH SPANS, APPROXIMATELY 7,833,303 LBS)	1.00	LS		\$	
1360	08170		SHEAR CONNECTORS (APPROXIMATELY 40,562 LBS)	1.00	LS		\$	
1370	08267		NAVIGATION LIGHTING	1.00	LS		\$	
1380	08500		APPROACH SLAB	203.00	SQYD		\$	
1390	08820		DRAIN PIPE-6 IN (FIBERGLASS)	290.00	LF		\$	
1400	20154ND		DRAIN ASSEMBLY	29.00	EACH		\$	
1410	20745ED		ROCK SOUNDINGS	3,177.00	LF		\$	
1420	20746ED		ROCK CORINGS	2,403.00	LF		\$	
1430	21322NC		CSL TESTING (6 TUBES)	19.00	EACH		\$	
1440	23538EC		PEDESTRIAN RAIL	2,022.00	LF		\$	
1450	23859EC		FINGER EXPANSION JOINT	74.00	LF		\$	
1460	23868EC		STRUCTURE LIGHTNING PROTECTION	1.00	LS		\$	
1470	24538ED		RAIL SYSTEM TYPE 11	3,664.00	LF		\$	
1480	24550EC		VIBRATION MONITORING	1.00	LS		\$	
1490	24606ED		HSS BARRIER RAIL - 3 RAIL	2,008.00	LF		\$	
1500	24607ED		HSS BARRIER RAIL - 1 RAIL	2,022.00	LF		\$	
1510	24611EC		SEISMIC DAMPERS	6.00	EACH		\$	
1520	24614EC		DISK EXPANSION BEARING	12.00	EACH		\$	
1530	24616EC		PATH DELINEATION LIGHTING	1.00	LS		\$	
1540	24617EC		INSTALL (PRECC DUCTBANK)	1,808.00	LF		\$	
1550	24617EC		INSTALL (AT&T DUCTBANK)	1,808.00	LF		\$	
1560	24629EC		DECORATIVE FENCE PANEL	23.00	EACH		\$	
1570	24732EC		DRILLED SHAFT-84 IN-COMMON	1,140.00	LF		\$	
1580	24733EC		DRILLED SHAFT-78 IN-ROCK	258.00	LF		\$	
1590	24734EC		TECHNIQUE SHAFT WITH REMEDIATION	1.00	EACH		\$	
1600	24735EC		REMEDIATED DRILLED SHAFT-COMMON	604.00	LF		\$	
1610	24736EC		REMEDIATED DRILLED SHAFT-ROCK	253.00	LF		\$	
1620	24737EC		CAVITY STABILIZATION	2,659.00	CUYD		\$	
1630	24738EC		REDRILLING CAVITY STABILIZATION	147.00	LF		\$	
1640	24740EC		CONSTRUCTION ACCESS	1.00	LS		\$	
1650	24741EC		SONAR CALIPER TESTING	38.00	EACH		\$	
1660	24742EC		TIP TESTING (6 TUBES)	19.00	EACH		\$	

Section: 0005 - BRIDGE - MAIN SPAN

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1670	02998		MASONRY COATING	4,954.00	SQYD		\$	
1680	08100		CONCRETE-CLASS A (MASS CONCRETE: 4,860 CY)	5,408.00	CUYD		\$	
1690	08104		CONCRETE-CLASS AA	1,178.00	CUYD		\$	
1700	08150		STEEL REINFORCEMENT	1,015,680.00	LB		\$	
1710	08151		STEEL REINFORCEMENT-EPOXY COATED	383,465.00	LB		\$	
1720	08160		STRUCTURAL STEEL (ARCH SPAN, APPROXIMATELY 4,786,384 LBS.)	1.00	LS		\$	
1730	08170		SHEAR CONNECTORS (APPROXIMATELY 29,373 LBS)	1.00	LS		\$	
1740	08267		NAVIGATION LIGHTING	1.00	LS		\$	
1750	08534		CONCRETE OVERLAY-LATEX	180.00	CUYD		\$	
1760	08752		PAINT CLEARANCE GAUGES	1.00	LS		\$	
1770	08820		DRAIN PIPE-6 IN (FIBERGLASS)	36.00	LF		\$	
1780	20154ND		DRAIN ASSEMBLY	10.00	EACH		\$	
1790	21322NC		CSL TESTING (6 TUBES)	20.00	EACH		\$	
1800	23000EX		DRILLED SHAFT-66 IN (ROCK)	211.00	LF		\$	
1810	23249EC		DRILLED SHAFT-72 IN COMMON	1,952.00	LF		\$	
1820	23538EC		PEDESTRIAN RAIL	605.00	LF		\$	
1830	23868EC		STRUCTURE LIGHTNING PROTECTION	1.00	LS		\$	
1840	24112EC		STEEL REINFORCEMENT STAINLESS STEEL	283,395.00	LB		\$	
1850	24538ED		RAIL SYSTEM TYPE 11	1,108.00	LF		\$	
1860	24550EC		VIBRATION MONITORING	1.00	LS		\$	
1870	24606ED		HSS BARRIER RAIL - 3 RAIL	605.00	LF		\$	
1880	24607ED		HSS BARRIER RAIL - 1 RAIL	605.00	LF		\$	
1890	24608EC		BRIDGE STRAND HANGER-FABRICATE & INSTALL	1.00	LS		\$	
1900	24610EC		MODULAR EXPANSION JOINT	148.00	LF		\$	
1910	24615EC		ARCH FEATURE LIGHTING	1.00	LS		\$	
1920	24616EC		PATH DELINEATION LIGHTING	1.00	LS		\$	
1930	24617EC		INSTALL (PRECC DUCTBANK)	556.00	LF		\$	
1940	24617EC		INSTALL (AT&T DUCTBANK)	556.00	LF		\$	
1950	24629EC		DECORATIVE FENCE PANEL	7.00	EACH		\$	
1960	24730ED		INSPECTION SAFETY LINE	4,300.00	LF		\$	
1970	24737EC		CAVITY STABILIZATION	8.00	CUYD		\$	
1980	24738EC		REDRILLING CAVITY STABILIZATION	5.00	LF		\$	
1990	24740EC		CONSTRUCTION ACCESS	1.00	LS		\$	
2000	24741EC		SONAR CALIPER TESTING	21.00	EACH		\$	
2010	24742EC		TIP TESTING (6 TUBES)	20.00	EACH		\$	

Section: 0006 - BRIDGE - EAST APPROACH

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2020	02231		STRUCTURE GRANULAR BACKFILL	1,036.00	CUYD		\$	

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LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2030	02599		FABRIC-GEOTEXTILE TYPE IV	546.00	SQYD		\$	
2040	02998		MASONRY COATING	7,889.00	SQYD		\$	
2050	03299		ARMORED EDGE FOR CONCRETE	76.00	LF		\$	
2060	08001		STRUCTURE EXCAVATION-COMMON	1,547.00	CUYD		\$	
2070	08100		CONCRETE-CLASS A (MASS CONCRETE: 1,032 CY)	3,037.00	CUYD		\$	
2080	08104		CONCRETE-CLASS AA	3,983.00	CUYD		\$	
2090	08150		STEEL REINFORCEMENT	839,056.00	LB		\$	
2100	08151		STEEL REINFORCEMENT-EPOXY COATED	1,407,894.00	LB		\$	
2110	08160		STRUCTURAL STEEL (APPROACH SPANS, APPROXIMATELY 5,876,144 LBS)	1.00	LS		\$	
2120	08170		SHEAR CONNECTORS (APPROXIMATELY 38,058 LBS.)	1.00	LS		\$	
2130	08267		NAVIGATION LIGHTING	1.00	LS		\$	
2140	08500		APPROACH SLAB	203.00	SQYD		\$	
2150	08820		DRAIN PIPE-6 IN (FIBERGLASS)	370.00	LF		\$	
2160	20154ND		DRAIN ASSEMBLY	37.00	EACH		\$	
2170	20745ED		ROCK SOUNDINGS	26.00	LF		\$	
2180	20746ED		ROCK CORINGS	39.00	LF		\$	
2190	21321NC		CSL TESTING (4 TUBES)	17.00	EACH		\$	
2200	21322NC		CSL TESTING (6 TUBES)	16.00	EACH		\$	
2210	22588NN		TECHNIQUE SHAFT	1.00	EACH		\$	
2220	23538EC		PEDESTRIAN RAIL	1,646.00	LF		\$	
2230	23583EC		DRILLED SHAFT-48 IN-COMMON	269.00	LF		\$	
2240	23584EC		DRILLED SHAFT-42 IN-ROCK	243.00	LF		\$	
2250	23859EC		FINGER EXPANSION JOINT	74.00	LF		\$	
2260	23868EC		STRUCTURE LIGHTNING PROTECTION	1.00	LS		\$	
2270	24538ED		RAIL SYSTEM TYPE 11	2,952.00	LF		\$	
2280	24550EC		VIBRATION MONITORING	1.00	LS		\$	
2290	24606ED		HSS BARRIER RAIL - 3 RAIL	1,622.00	LF		\$	
2300	24607ED		HSS BARRIER RAIL - 1 RAIL	1,625.00	LF		\$	
2310	24611EC		SEISMIC DAMPERS	6.00	EACH		\$	
2320	24614EC		DISK EXPANSION BEARING	12.00	EACH		\$	
2330	24616EC		PATH DELINEATION LIGHTING	1.00	LS		\$	
2340	24617EC		INSTALL (PRECC DUCTBANK)	1,454.00	LF		\$	
2350	24617EC		INSTALL (AT&T DUCTBANK)	1,454.00	LF		\$	
2360	24629EC		DECORATIVE FENCE PANEL	18.00	EACH		\$	
2370	24732EC		DRILLED SHAFT-84 IN-COMMON	1,303.00	LF		\$	
2380	24733EC		DRILLED SHAFT-78 IN-ROCK	194.00	LF		\$	
2390	24735EC		REMEDiated DRILLED SHAFT-COMMON	20.00	LF		\$	
2400	24736EC		REMEDiated DRILLED SHAFT-ROCK	11.00	LF		\$	
2410	24737EC		CAVITY STABILIZATION	24.00	CUYD		\$	
2420	24738EC		REDRILLING CAVITY STABILIZATION	21.00	LF		\$	
2430	24740EC		CONSTRUCTION ACCESS	1.00	LS		\$	
2440	24741EC		SONAR CALIPER TESTING	16.00	EACH		\$	
2450	24742EC		TIP TESTING (6 TUBES)	16.00	EACH		\$	
2460	24743EC		TIP TESTING (4 TUBES)	17.00	EACH		\$	

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Section: 0007 - TRAINEES

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2470	02742		TRAINEE PAYMENT REIMBURSEMENT IRONWORKER	1,400.00	HOUR		\$	
2480	02742		TRAINEE PAYMENT REIMBURSEMENT IRONWORKER	1,400.00	HOUR		\$	
2490	02742		TRAINEE PAYMENT REIMBURSEMENT GROUP 2, 3 OR 4 OPERATOR	1,400.00	HOUR		\$	
2500	02742		TRAINEE PAYMENT REIMBURSEMENT CARPENTER	1,400.00	HOUR		\$	
2510	02742		TRAINEE PAYMENT REIMBURSEMENT CEMENT MASON	1,200.00	HOUR		\$	

Section: 0008 - DEMOBILIZATION & MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2520	02568		MOBILIZATION	1.00	LS		\$	
2530	02569		DEMOBILIZATION	1.00	LS		\$	